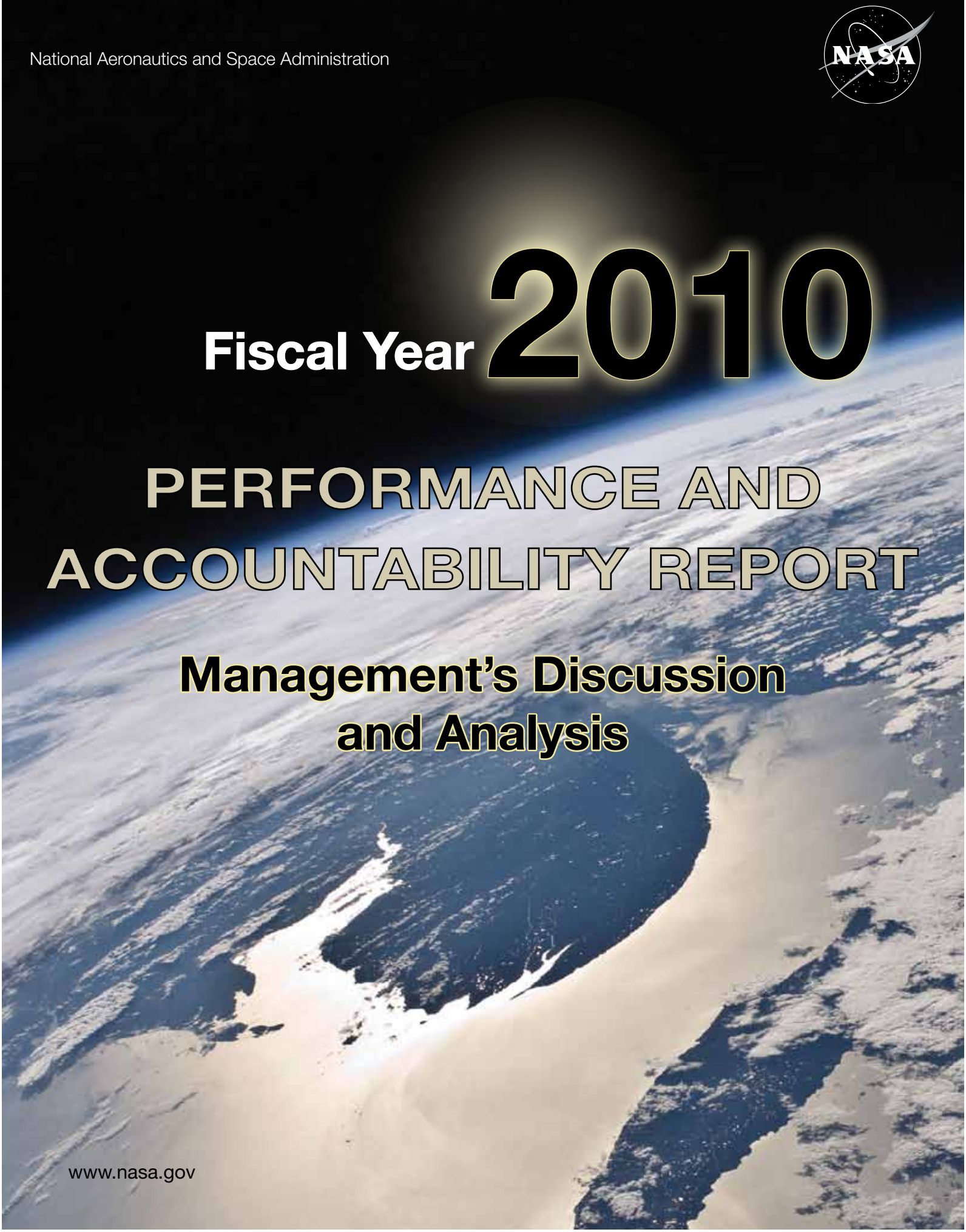
National Aeronautics and Space Administration



Fiscal Year 2010

PERFORMANCE AND ACCOUNTABILITY REPORT

Management's Discussion and Analysis

www.nasa.gov

Message from the Administrator

November 15, 2010

I am pleased to present NASA's FY 2010 Performance and Accountability Report (PAR). This report documents NASA's progress toward achieving the challenging mission of space exploration, scientific discovery, and aeronautics research as outlined in our Strategic Plan. Further, the performance and financial information presented in this report highlights our efforts to manage taxpayer dollars responsibly, while adhering to NASA's core values of Safety, Integrity, Teamwork, and Excellence.

We are proud of all of our accomplishments this year, and specific information is highlighted and discussed in the *Detailed Performance* Section of this report. However, I would like to mention a few of our specific accomplishments. We had four successful Space Shuttle launches to the International Space Station (ISS) since last November, to complete its construction and outfit it as a scientific facility like no other. The 10th anniversary of humans aboard the station was a true milestone, and we're entering an era where it will reach its true potential as an orbiting laboratory. Likewise, we were pleased to recognize the 20th anniversary of the launching of the Hubble Space Telescope and to begin seeing new results from the instruments with which it was outfitted on last year's servicing mission. This year, we also marked the 50th anniversary of weather observations from space—a year in which our Earth-observing satellites were also helpful in assessing the status on the ground after disasters such as the Haiti earthquake and the Gulf oil spill. Most recently, a NASA team assisted the Chilean government, through the U. S. Department of State, to provide technical advice that assisted the trapped miners at the San Jose gold and copper mine.

NASA launched the following science missions: Widefield Infrared Survey Explorer (WISE); Solar Dynamics Observatory (SDO); and Geostationary Operational Environmental Satellite (GOES). WISE will scan the entire sky to uncover objects never seen before, helping to answer fundamental questions about the origins of planets, stars, and galaxies. SDO began sending back amazing images of the sun that will help us understand our neighbor and its effects on our planet and our communications systems. In September 2010, the latest Geostationary Operational Environmental Satellite, GOES-15 (also known as GOES-P), was accepted into service. It is designed to watch for storm development and weather conditions on Earth, relay communications, provide search-and-rescue support, and also provide additional capacity for our Nations' weather observing system.

Exploration Systems successfully tested the Ares 1-X for a two-minute powered flight. Results from this test will be helpful in developing the next generation of American spaceflight vehicles that could take humans beyond low-Earth orbit. Our Lunar Reconnaissance Orbiter helped us map the Moon and transform our understanding of it. Aeronautics completed the first phase of the X48-B Low Speed Flight Test Program of a Hybrid wing body aircraft, which is intended to reduce environmental impacts associated with aviation. NASA engineers and scientists tested new rocket motors, moved forward on aviation technologies to make air travel safer and cleaner, and worked with students around the country to help widen the pipeline of future leaders.

In June 2010, NASA launched its Summer of Innovation program, in support of the President's Educate to Innovate campaign for excellence in science, technology, engineering, and mathematics (STEM) education. Our first round of activities gave students in Wyoming, Idaho, Massachusetts, and New Mexico hands-on experience with space missions and science experiments. In FY 2011, we will continue to expand this important work to help develop students' interest in the core STEM disciplines. In addition, NASA awarded cooperative agreements to organizations across the United States to enhance learning through the use of NASA's Earth Science resources. The selected organizations include colleges and universities, nonprofit groups, and community college representatives.

As Administrator, one of my key responsibilities defined in the Space Act of 1958 (as amended) is to "provide for the widest practicable and appropriate dissemination of information concerning (NASA's) activities and the results thereof." As such, NASA embraces the White House's Open Government initiative calling on executive branch agencies to become more open and accountable. From making our open source software development more collaborative to creating a cloud computing platform, or making our social networks easily accessible and conducive to interaction, NASA is taking many steps to implement this openness in all of its activities. Also worthy of note is NASA's successful initiative to fund, track, and report on its accomplishment toward the goals and objectives of the American Recovery and Reinvestment Act (Recovery Act). NASA received $1,050 million of Recovery Act funding in fiscal year 2009 ($1,002 million Direct Appropriation and $48 million Reimbursable Authority), all of which has been obligated on projects to support the Nation's economic recovery and advance NASA's research mission. The Agency received an additional $4 million in Recovery Act Reimbursable Authority in FY 2010.

Although NASA was unable to achieve the Agency's Strategic Goal to retire the Space Shuttle by the end of FY 2010, the Agency plans to retire the Space Shuttle within the next year. Despite a year of transition and uncertainty, on September 29, 2010, the United States Congress voted resoundingly to endorse a clear path forward for NASA. Drawing on the ambitious plan for our Agency laid out by President Barack Obama, the Congress approved the National Aeronautics and Space Administration Authorization Act of 2010, which was signed by the President on October 11, 2010. This Act helps put the U.S. space program on a more sustainable trajectory that will lead to greater technological capabilities for our Nation, a new commercial space transportation industry, deeper international partnerships, and missions that will help inspire a new generation of Americans. With this new direction, we will also extend the life of the ISS, expand our investments in green aviation, Earth observation and education, and work to create thousands of new jobs in a vibrant, forward-looking economy.

NASA makes every effort to ensure that performance data are subject to the same attention to detail as is devoted to our scientific and technical research. With this in mind, I can provide reasonable assurance that the performance data in this report are reliable and complete. Any data limitations are documented explicitly in the report.

In addition, NASA accepts the responsibility of accounting for and reporting on its financial activities. During FY 2010, NASA resolved the one remaining prior year internal control material weakness. The successful resolution of the prior year material weakness—Controls over Legacy Property, Plant, and Equipment related to valuation of legacy assets—is a result of extensive management involvement across the Agency. This achievement resulted from a sound system of financial controls and adherence to our Comprehensive Compliance Strategy and our Continuous Monitoring Program. In addition, we are now in compliance with the Federal Financial Management Improvement Act. Based on the results of this year's efforts, I am able to provide reasonable assurance that this report's financial data are reliable and complete.

My goal and focus, as NASA Administrator, is to continue to foster NASA as an exceptional resource for this Nation while keeping a sharp eye on our core values. We must always strive to find innovative ways to use NASA's missions to enhance our Nation's educational, scientific, and technological capacity.

Charles F. Bolden, Jr.
Administrator

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Welcome to NASA

NASA's Mission

National Aeronautics and Space Administration (NASA) was created by the National Aeronautics and Space Act of 1958. The Agency was created to provide for research into problems of flight within and outside the Earth's atmosphere and to ensure that the United States conducts activities in space devoted to peaceful purposes for the benefit of mankind.

NASA's Mission Statement

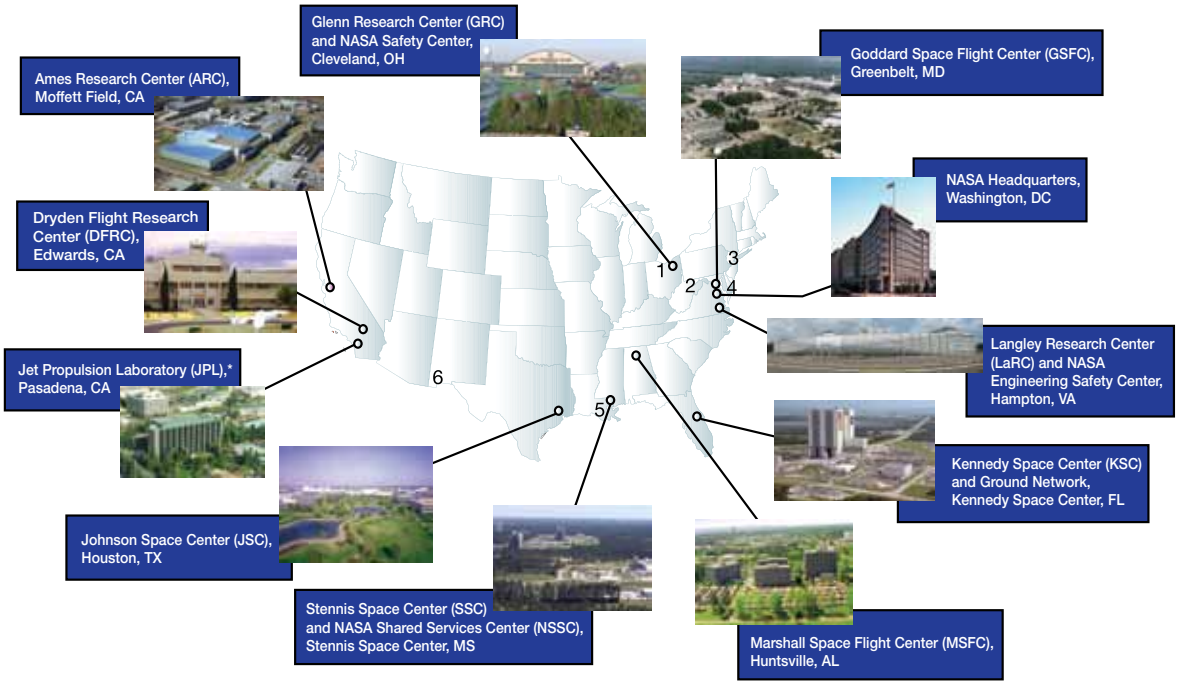
To pioneer the future in space exploration, scientific discovery, and aeronautics research.

NASA's Organization

NASA is comprised of Headquarters in Washington, DC, nine Centers located around the country, and the Jet Propulsion Laboratory, a Federally Funded Research and Development Center (FFRDC) operated under a contract with the California Institute of Technology. In addition, NASA partners with academia, the private sector, state and local governments, other Federal agencies, and a number of international organizations, to create an extended NASA family of civil servants, contractors, allied partners, and stakeholders.

Photo above: NASA astronaut Clayton Anderson, STS-131 mission specialist, participates in the mission's first session of space-walks on April 9, 2010, as construction and maintenance continue on the International Space Station. Reflected in his helmet is Rick Mastracchio, mission specialist, who helped him move a new 1,700-pound ammonia tank from Space Shuttle *Discovery*'s cargo bay to a temporary parking place on the station, retrieve an experiment from the Japanese Kibo Laboratory exposed facility, and replace a Rate Gyro Assembly on one of the truss segments. (Credit: NASA)

NASA Centers and Other Facilities



*The Jet Propulsion Laboratory is a FFRDC, NASA-owned and managed under the terms of a contract with the California Institute of Technology. The workforce are employees of the California Institute of Technology.

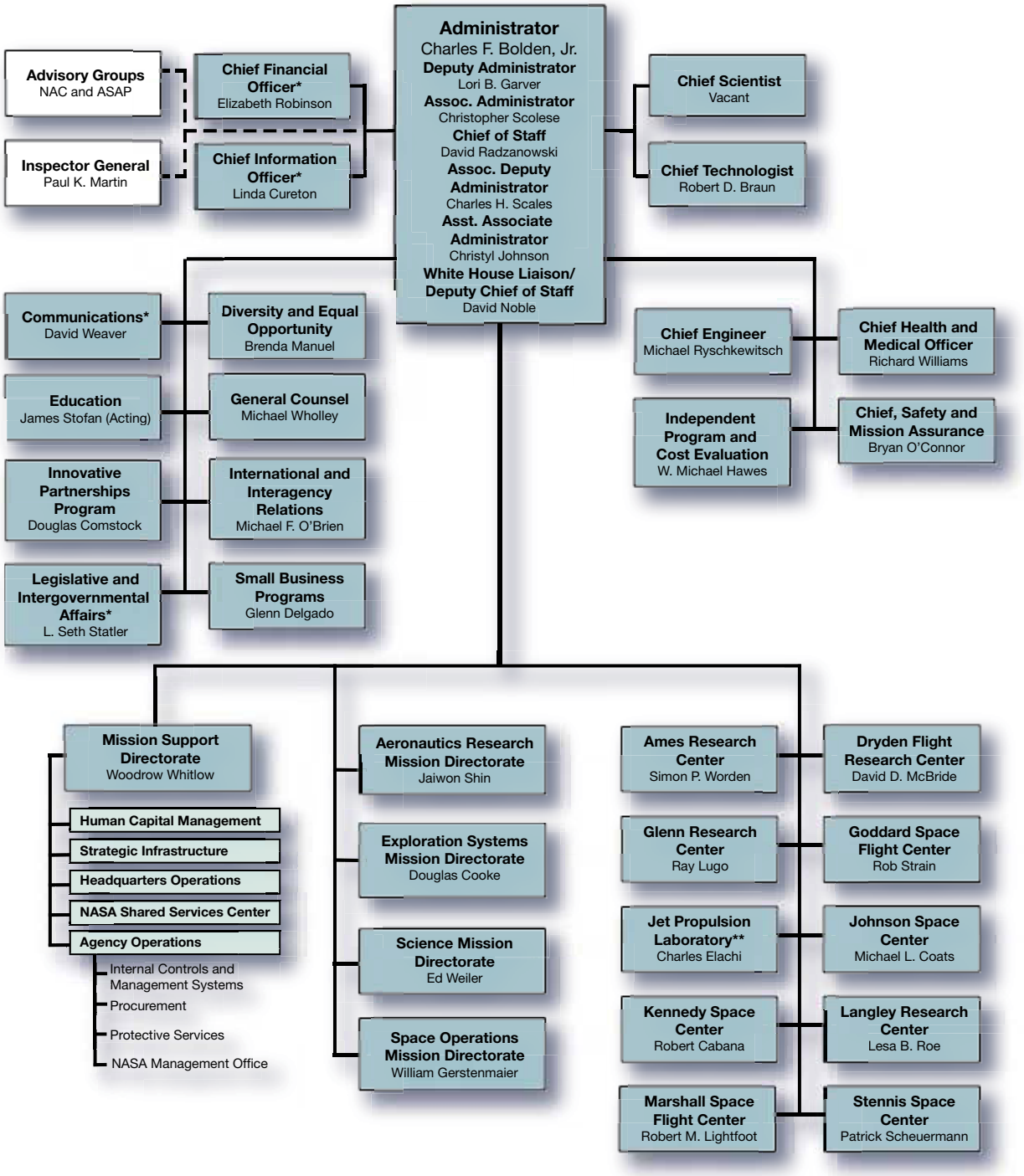
Other NASA facilities include: 1) Plum Brook Station, Sandusky, OH, managed by GRC; 2) Software Independent Verification and Validation Facility, Fairmont, WV, managed by GSFC; 3) Goddard Institute for Space Studies, New York, NY, managed by GSFC; 4) Wallops Flight Facility, Wallops, VA, managed by GSFC; 5) Michoud Assembly Facility, New Orleans, LA, managed by MSFC; and 6) White Sands Test Facility and Space Network, White Sands, NM, managed by JSC.

NASA's science, research, and technology development work is focused and implemented through four Mission Directorates and supported by one Mission Support Directorate:

- The **Aeronautics Research Mission Directorate (ARMD)** conducts fundamental research in aeronautical disciplines and develops capabilities, tools, and technologies that will significantly enhance aircraft performance, safety, and environmental compatibility, as well as increase the capacity and flexibility of the U.S. air transportation system.
- The **Science Mission Directorate (SMD)** conducts the scientific exploration of Earth, the Sun, the solar system, and the universe. SMD's missions include ground-, air-, and space-based observatories, deep-space automated spacecraft, and planetary orbiters, landers, and surface rovers. SMD also develops innovative science instruments and techniques in pursuit of NASA's science goals.
- The **Exploration Systems Mission Directorate (ESMD)** develops the capabilities for long-duration human and robotic exploration. ESMD is conducting robotic precursor missions, developing human transportation elements, creating innovative life support and medical technologies, and establishing international and commercial partnerships. On February 1, 2010, the President released the FY 2011 Budget Request, which proposed several new programs that seek to foster sustainable human space exploration. Study teams are exploring the program options and the optimal path for making NASA's near- and long-term goals possible.
- The **Space Operations Mission Directorate (SOMD)** directs spaceflight operations, space launches, and space communications and manages the operation of integrated systems in low Earth orbit and beyond, including the ISS. SOMD is laying the foundation for future missions beyond Earth orbit by using the ISS as an orbital outpost where astronauts can test systems and technology.
- The **Mission Support Directorate** (created in February 2010) strengthens the efficiency and management of Agency level operations under a single Associate Administrator. These Agency-level activities include Center Management and Operations, Agency Management and Operations, Construction of Facilities, Human Capital and Infrastructure.

For more detailed information about NASA's organization go to *http://www.nasa.gov/about/org_index.html*.

NASA's Organization Structure



NASA organization as of September 30, 2010.

*Center functional office directors report to Agency functional Associate Administrators. Deputy and below report to Center leadership.

**The Jet Propulsion Laboratory is a FFRDC operated under a contract with the California Institute of Technology.

White boxes indicate independent organizations that report to the Administrator.

NASA's Workforce

NASA employs over 18,000 civil servants at nine Centers, Headquarters, and the NASA Shared Services Center, with an additional 5,000 people at the Jet Propulsion Laboratory. At every NASA location across the country, NASA employees work to contribute their time and talents to the local community.

NASA improved its already-high score in the Partnership for Public Service's Best Places to Work survey of Federal agencies as identified by employees, increasing the Agency's overall index score by 3.5 percent over 2009 and ranking fifth out of 32 agencies reviewed (see *http://data.bestplacestowork.org/bptw/index* for more information). NASA's ratings improved in Strategic Management, Effective Leadership, Performance Based Rewards and Advancement, Training and Development, and Pay. However, the survey also revealed areas in need of improvement such as Teamwork, which dropped from a rating of 80.0 in 2009 to 75.9 in 2010. Teamwork is a NASA Value, and NASA's employees constantly strive to strengthen workforce collaboration.

Shared Values, Shared Results

NASA has four shared core values that support and guide the Agency's commitment to technical and professional excellence. Every NASA employee believes that mission success is the natural outcome of an uncompromising commitment to safety, integrity, teamwork, and excellence.

Safety: Constant attention to safety is the cornerstone of NASA's mission success. NASA is committed, individually and as a team, to protecting the safety and health of the public, NASA team members, and the assets that the Nation entrusts to the Agency.

Integrity: NASA is committed to maintaining an environment of trust, built upon honesty, ethical behavior, respect, and candor. Agency leaders enable this environment by encouraging and rewarding a vigorous, open flow of communication on all issues, in all directions, and among all employees without fear of reprisal. Building trust through ethical conduct as individuals and as an organization is a necessary component of mission success.

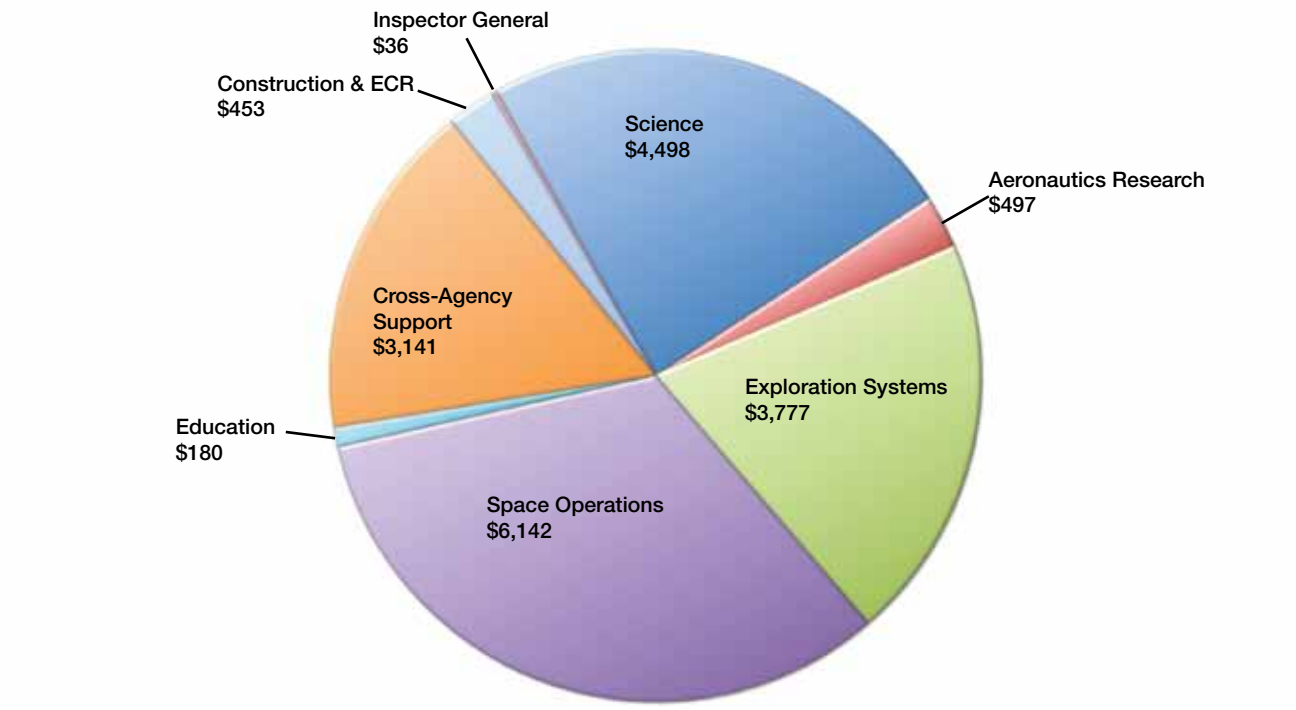
Teamwork: NASA strives to ensure that the Agency's workforce functions safely at the highest levels of physical and mental well-being. The most powerful tool for achieving mission success is a multi-disciplinary team of diverse, competent people across all NASA Centers. NASA's approach to teamwork is based on a philosophy that each team member brings unique experience and important expertise to project issues. Recognition of and openness to the insight of individual team members improves the likelihood of identifying and resolving challenges to safety and mission success. The Agency is committed to creating an environment that fosters teamwork and processes that support equal opportunity, collaboration, continuous learning, and openness to innovation and new ideas.

Excellence: To achieve the highest standards in engineering, research, operations, and management in support of mission success, NASA is committed to nurturing an organizational culture in which individuals make full use of their time, talent, and opportunities to pursue excellence in both the ordinary and the extraordinary.

Budget for Performance: NASA's FY 2010 Budget

NASA's FY 2010 budgetary resources totaled $18,724 million, an increase of about five percent from NASA's FY 2009 budget. This increase demonstrates a commitment to funding the balanced priorities set forth for the Agency in space exploration, Earth and space science, and aeronautics research. Operating plan changes reflect budget changes necessary to carry out Congressional and White House directives that occurred after the FY 2010 budget request. NASA's budget requests are available online at *http://www.nasa.gov/news/budget/index.html*.

NASA's FY 2010 Enacted Budget Total, Including July Operating Plan Adjustments: $18,724
(Dollars in Millions)



ECR is Environmental Compliance and Restoration. Construction and Environmental Compliance and Restoration became a budgetary line item as of the FY 2011 budget request, and it appears in NASA's FY 2010 operating plans.

Proud to Serve the Nation: American Recovery and Reinvestment Act

The American Recovery and Reinvestment Act of 2009 (Recovery Act) was signed into law by President Obama on February 17, 2009. It was an unprecedented effort to jump start the Nation's economy, create and save millions of jobs, and modernize the Nation's infrastructure so the country can thrive in the 21st century.

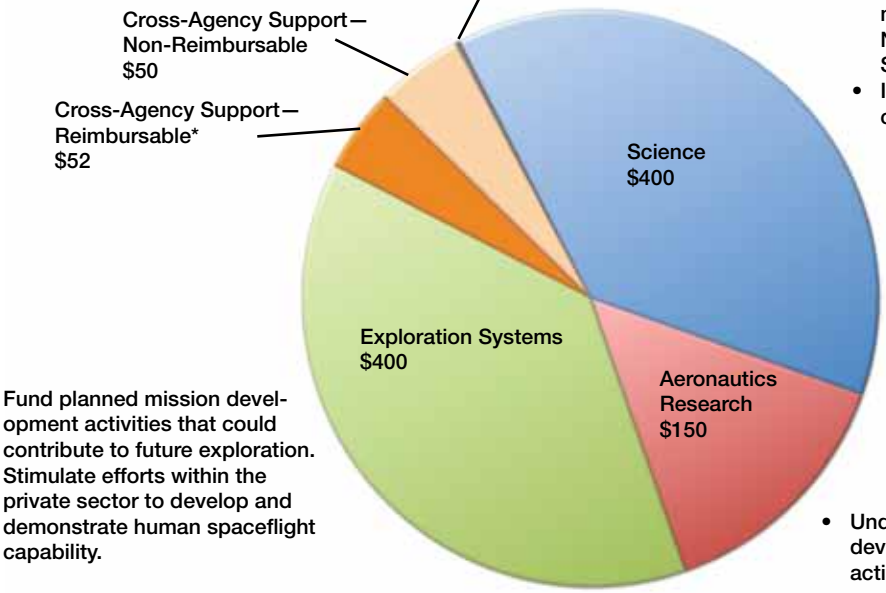
NASA received $1,050 million of Recovery Act funding in fiscal year 2009 ($1,002 million Direct Appropriation and $48 million Reimbursable Authority), all of which has been obligated on projects to support the Nation's economic recovery and advance NASA's research mission. The Agency received an additional $4 million in Recovery Act Reimbursable Authority in FY 2010. Details on the Agency's progress are available at *http://www.nasa.gov/recovery/index.html*. From satellites that track and trend weather and natural hazards to creating a safer, more

efficient air transportation system, NASA's employees are proud to contribute to the breakthroughs and activities that will aid America's economic recovery.

Among the key purposes of the Recovery Act are preserving and creating jobs, spurring technological advances in science and health, and promoting economic recovery. NASA has an important role to play in achieving these purposes through the program and facilities investments it is making with Recovery Act funding.

NASA Recovery Act Funding Total: $1,054
(Dollars in Millions)

- Restore NASA-owned facilities damaged by hurricanes and other natural disasters that occurred in 2008.



- Accelerate the development of Earth Science climate research missions recommended by the National Academies' Decadal Survey.
- Increase NASA's supercomputing capabilities.

- Fund planned mission development activities that could contribute to future exploration.
- Stimulate efforts within the private sector to develop and demonstrate human spaceflight capability.

- Undertake systems-level research, development, and demonstration activities related to aviation safety, environmental impact mitigation, and development of the Next Generation Air Transportation system (NextGen).

*Reimbursable activities for other Federal agencies' Recovery Act programs.

Performance Results

Managing and Measuring NASA's Performance

The Government Performance and Results Act of 1993 (GPRA) requires Federal agencies to issue plans for how the Agency intends to accomplish its mission. This process starts with a strategic plan that sets the mission and outlines an agency's goals and objectives for at least five years. The agency's annual performance plan then describes the performance indicators and program outputs needed to achieve the goals and objectives.

NASA's 2006 Strategic Plan established six Strategic Goals, with six Sub-goals under Strategic Goal 3.

Strategic Goal 1: Fly the Shuttle as safely as possible until its retirement, not later than 2010.

Strategic Goal 2: Complete the International Space Station in a manner consistent with NASA's International Partner commitments and the needs of human exploration.

Strategic Goal 3: Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of the human spaceflight program to focus on exploration.

Strategic Goal 4: Bring a new Crew Exploration Vehicle into service as soon as possible after Shuttle retirement.

Strategic Goal 5: Encourage the pursuit of appropriate partnerships with the emerging commercial space sector.

Strategic Goal 6: Establish a lunar return program having the maximum possible utility for later missions to Mars and other destinations.

Each of the six Strategic Goals is clearly defined and supported by multi-year Outcomes that enhance the Agency's ability to measure and report accomplishments. NASA also set Annual Performance Goals (APGs) that demonstrate progress for achieving Outcomes. The APGs are updated annually as part of the Performance Plan, included in NASA's annual Budget Estimates (available at *http://www.nasa.gov/news/budget/index.html*).

In addition to Outcomes and APGs for NASA's Strategic Goals, the Agency also has performance measures for Cross-Agency Support functions as well as Uniform and Efficiency Measure APGs. These measures help NASA to track performance in a number of program and project management areas, including life cycle schedule and cost, and competitive award processes. NASA organizes Efficiency Measure APGs by NASA's Budget Themes to emphasize and encourage individual program accountability.

NASA measures and communicates its progress toward achieving Outcomes and APGs through color ratings (Green, Yellow, Red, and White). NASA managers in the Mission Directorates and Mission Support Offices determine ratings for the multi-year Outcomes and APGs based on a series of internal and external assessments that are part of ongoing monitoring requirements in NASA's Performance Management System.

What do the color ratings mean?		
Color	**Multi-year Outcome Rating**	**Annual Performance Goal Rating**
Green	NASA achieved most APGs under this Outcome and is on-track to achieve or exceed this Outcome.	NASA achieved this APG.
Yellow	NASA made significant progress toward this Outcome; however, the Agency may not achieve this Outcome as stated.	NASA failed to achieve this APG, but made significant progress and anticipates achieving it during the next fiscal year.
Red	NASA failed to achieve most of the APGs under this Outcome and does not expect to achieve this Outcome as stated.	NASA failed to achieve this APG and does not anticipate completing it within the next fiscal year.
White	This Outcome was canceled by management directive or is no longer applicable based on management changes to the APGs.	This APG was canceled by management directive and NASA is no longer pursuing activities relevant to this APG, or the program did not have activities relevant to the APG during the fiscal year.

Managers rely on feedback from advisory groups and experts in the field to guide their rating decisions. Advisory groups like the NASA Advisory Council, the National Academies, and the Aerospace Safety Advisory Panel assess program content and direction. Experts from the science community also review the progress that projects and programs make toward meeting the performance measures under Sub-goals 3A through 3D, and managers assign ratings to the science-related Outcomes and APGs based on these experts' findings. The next page shows a breakdown of the FY 2010 performance results by percentages of Green, Yellow, Red, and White ratings for the Outcomes and APGs.

NASA's performance data provides a foundation for both programmatic and institutional decision-making processes and supports decisions concerning strategy and budget. Internally, the Agency monitors and analyzes how each program manages its budget and schedule. These analyses are provided during quarterly and monthly reviews at the Center, Mission Directorate, and Agency levels to communicate the health and performance of a program. The final performance results reflected in this report help inform planning for the forthcoming 2011 Strategic Plan and the FY 2012 budget request.

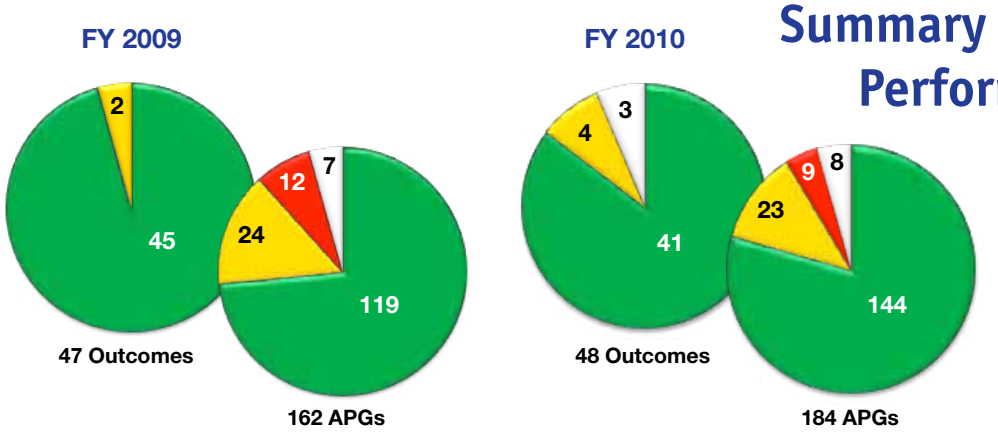
As part of the planning process, Mission Directorates are working to implement internal success criteria into their APGs and related projects. This internal rating process will help to determine whether each project is meeting its goal while emphasizing a more quantitative approach to performance measurement and rating. Nonetheless, advisory groups and expert advisors will continue to play an important role in rating decisions.

FY 2010 Cost Toward Strategic Goals

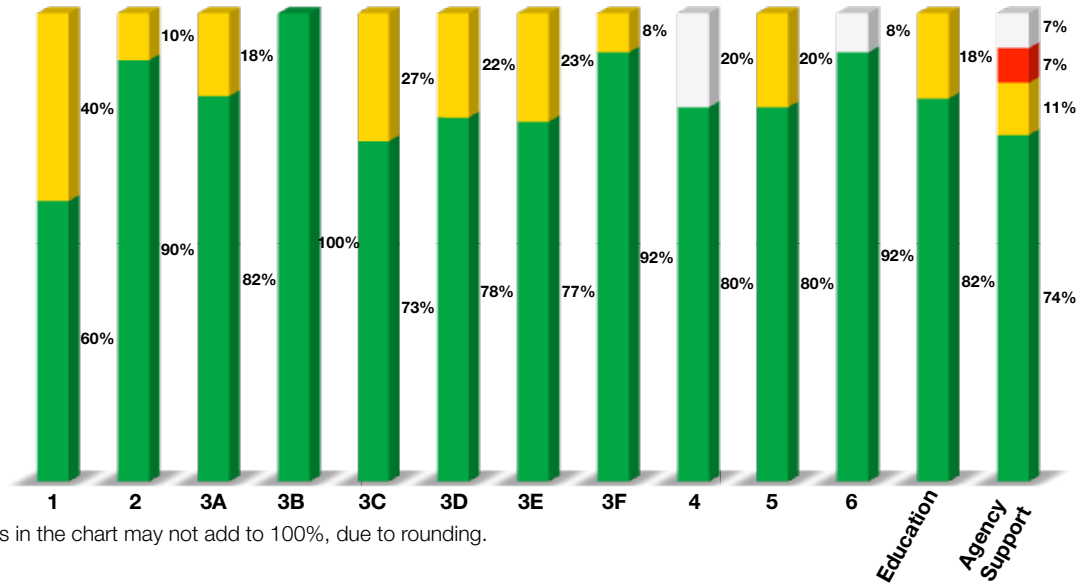
To measure cost toward Strategic Goals and Sub-goals, NASA maps the Mission Directorate's costs (i.e., Research and Development Initiatives as presented in the Statement of Net Cost) to the Strategic Goals and Sub-goals through Themes and programs. In 2003, NASA created Themes as a bridge to connect related Agency programs and projects to the Mission Directorates or equivalents that manage the programs. Themes group together similar programs, such as the programs that conduct Earth science or support the Agency's spaceflight missions, into budgeting categories. NASA uses Themes and programs to track performance areas, with Themes often contributing to a single Strategic Goal or Sub-goal.

NASA analyzes the fiscal year's final operating plan (this year issued in July) to determine the portion of each Mission Directorate budget allocated to each Theme and/or program, thus tying it to a particular Strategic Goal or Sub-goal. The Agency's analysts then use NASA's Statement of Net Cost to allocate Research and Development Initiatives cost to the Themes and then Strategic Goals and Sub-Goals based on the relationships determined in the operating plan.

Summary of NASA's Performance



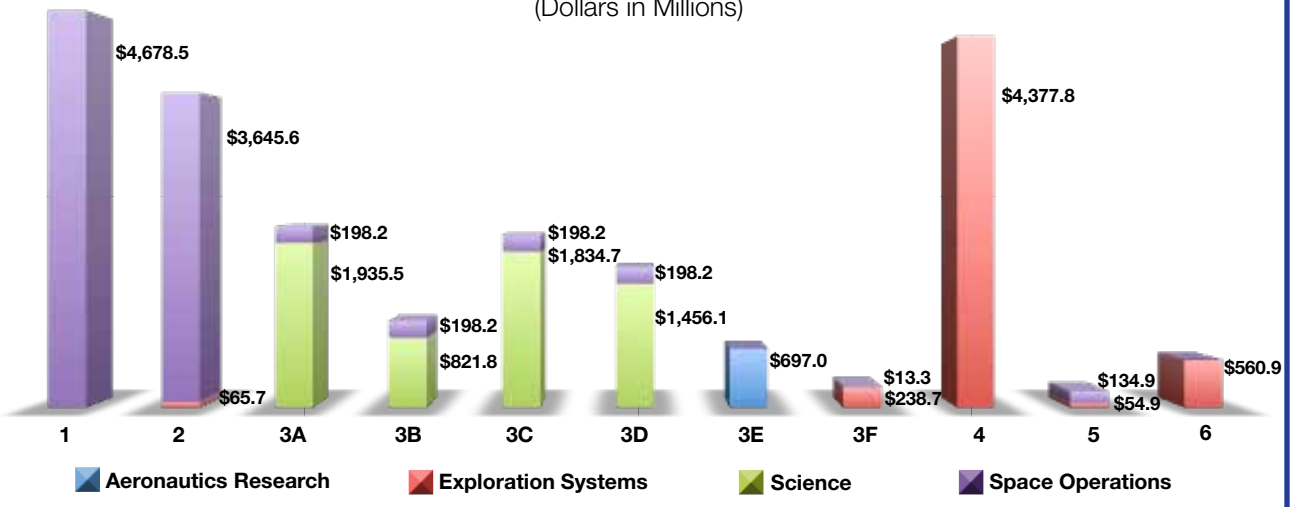
FY 2010 APG Ratings by Strategic Goal or Equivalent



Amounts in the chart may not add to 100%, due to rounding.

FY 2010 Cost by Strategic Goal

(Dollars in Millions)



Total cost is $21,308.0

Amounts in the chart may not agree with the total, as per the Statement of Net Cost, or totals in *Detailed Performance* due to rounding.

Performance Highlights

The following section highlights NASA's significant achievements and efforts under each Strategic Goal in FY 2010. For complete ratings and narratives describing NASA's progress toward achieving the Agency's APGs, multi-year Outcomes and Strategic Goals, please see the *Detailed Performance* section. For more information on NASA's missions, please see the NASA's Missions at a Glance located in the *Other Accompanying Information* section of this document.

Strategic Goal 1: Fly the Shuttle as safely as possible until its retirement, not later than 2010.

Responsible Mission Directorate: Space Operations

This Highlight achieved in pursuit of Outcome 1.1 in NASA's FY 2010 Performance Plan Update.

A Busy Year for the Space Shuttle and Its Crews

The Space Shuttle safely and successfully completed every mission objective for all four flights in FY 2010.

The focus of the Space Shuttle flights to the ISS this year was on delivering the final pressurized elements and provisioning the Station to support operations and utilization through the next 10 years and potentially beyond. Due to operational considerations, NASA extended the STS-133 and STS-134 missions into FY 2011. NASA maintains the option of flying one additional mission, STS-135, if so directed using flight hardware already in place to support contingency rescue operations for STS-134. This action was taken with the express consent of all stakeholders to ensure the safety of these flights and the ongoing success of the ISS partnership.

The STS-129 mission, launched on November 16, 2009, focused on staging spare components on the outside of the ISS, including gyroscopes, nitrogen and ammonia tank assemblies, pump modules, and end effectors for the ISS robotic arm.

STS-130, launched on February 8, 2010, saw the delivery and installation of the Tranquility (formerly Node 3) module and the Cupola. The name for the Tranquility module was suggested through a NASA public outreach effort, tying together the installation of the last planned U.S. pressurized module with history of space exploration and the landing of Apollo 11 at Tranquility Base on the Moon in July 1969.

STS-131, launched on April 5, 2010, carried the Italian-built Multi-Purpose Logistics Module (MPLM) Leonardo loaded with eight tons of science equipment and cargo. Leonardo will return to the ISS one last time on STS-133 when it is permanently installed to the Station.

The final mission of the fiscal year, STS-132, was launched on May 14, 2010, carrying the final scientific module destined for ISS, the Russian Rassvet Mini Research Module, as well as over 5,300 pounds of external supplies on an Integrated Cargo Carrier–Vertical Light Deployable (ICC-VLD) pallet in the cargo bay. As part of the process of retiring the Space Shuttle, the last set of Solid Rocket Motors (RSRM-114) and the last production External Tank (ET-138) were delivered to the Kennedy Space Center.

Credit: NASA

The Canadarm2 transfers the Tranquility module from Endeavour's payload bay to its new position on the port side of the ISS Unity node (visible in the upper left corner) on February 11, 2010.

Strategic Goal 2: Complete the International Space Station in a manner consistent with NASA's International Partner commitments and the needs of human exploration.

Responsible Mission Directorate: Space Operations

This Highlight achieved in pursuit of Outcomes 2.1 and 2.2 in NASA's FY 2010 Performance Plan Update.

ISS Gets New Windows on the World and Research Facilities

FY 2010 was a very busy year onboard the ISS. In November 2009, the Shuttle mission STS-129 delivered close to 30 thousand pounds of replacement parts packed onto two Express Logistics Carriers which ISS crew members transferred and attached to the ISS truss. NASA stationed the spare parts on the ISS in anticipation of the Shuttle's retirement in 2011. In February 2010, the STS-130 Shuttle mission delivered and installed the Tranquility module and dome-shaped, window-filled Cupola. The Cupola has seven windows, six around the sides and one on top. Just under ten feet in diameter, the module will accommodate two crew members and portable workstations that can control Station and robotic activities. The multi-directional view will allow the crew to monitor spacewalks and docking operations, as well as provide a spectacular view of Earth and other celestial objects.

Credit: NASA

STS-130 astronaut Nicholas Patrick works on the newly installed Cupola on February 10, 2010. During the spacewalk he and fellow astronaut Robert Behnken removed the insulation blankets and launch restraint bolts from each of the Cupola's seven windows.

In April 2010, the STS-131 mission delivered over 17 thousand pounds of equipment to the Station in the multi-purpose logistics module Leonardo. This mission also marked the first time four women were in space and the first time Japan had two of its astronauts in space at the same time.

An important part of achieving Strategic Goal 2 is turning the ISS into an effective on-orbit research laboratory for testing technologies and capabilities for space exploration and Earth applications. As part of the International Partner commitments, the crew share facilities and execute scientific experiments from all partners, making the most of available resources as the outpost approaches full operations. In addition to the scientific racks and experiments already on board, the STS-131 mission delivered four new utilization racks to the Station: the Window Observational Research Facility (WORF), the Muscle Atrophy Research and Exercise System (MARES), the EXpedite the PRocessing of Experiments to Space Station (ExPRESS) Rack 7, and the Minus Eighty-Degree Laboratory Freezer for ISS (MELFI). In May 2010, the STS-132 mission delivered the Russian Mini Research Module Rassvet (meaning dawn) along with a new backup space-to-ground antenna and replacement batteries for the Station power system. The Rassvet contains eight workstations designed for a variety of space experiments and educational research. It also will provide an additional docking port for Russian Soyuz and Progress vehicles.

More information on the many ISS experiments conducted during each Expedition can be found at *http://www.nasa.gov/mission_pages/station/main/index.html*.

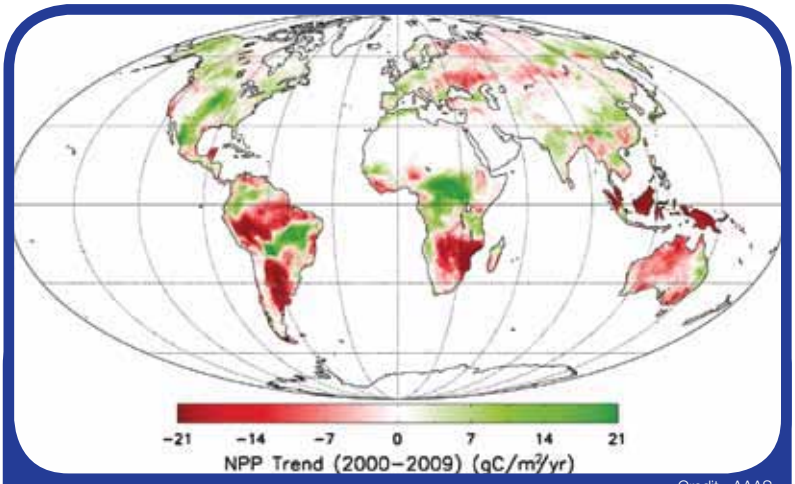
Sub-Goal 3A: Study Earth from space to advance scientific understanding and meet societal needs.

Responsible Mission Directorate: Science

This Highlight achieved in pursuit of Outcome 3A.3 in NASA's FY 2010 Performance Plan Update.

NASA Measures Changes in Plant Productivity

At the base of Earth's food web are terrestrial plants and algae, the organisms responsible for primary production, the production of organic compounds from carbon dioxide and water. Almost all life on Earth is directly or indirectly reliant on these primary production organisms. NASA research has succeeded in quantifying global land cover and examining trends and processes in ecosystems, revealing the impact of drought on plant production and Earth's ecosystems.



Credit: AAAS

NASA-funded researchers analyzed time series data from Terra's Moderate Resolution Imaging Spectroradiometer (MODIS) in combination with climate data. Areas in green had increased net primary productivity and those colored red had decreased net primary productivity. Over the Northern Hemisphere, 65 percent of vegetated land area had increased net primary production, while in the Southern Hemisphere, 70 percent of vegetated land areas had decreased net primary productivity.

Net primary production quantifies the amount of atmospheric carbon fixed by plants and accumulated as biomass, the living component of Earth's ecosystems. Past research has shown that increased temperatures and solar radiation around the globe have allowed an upward trend in terrestrial net primary production from 1982 through 1999. From data obtained from air- and space-borne sensors, NASA has produced new maps of forests and wetlands and has further studied changes in global land cover, forest heights, ocean productivity, and terrestrial biomass accumulation following disturbances. A new study based on ten years of satellite data reported that the previously observed increasing trend in terrestrial primary production has reversed and now shows a weak decline. The recent analysis shows that since 2000, high-latitude northern hemisphere forests have continued to benefit from warmer temperatures and a longer growing season. However, in the southern hemisphere widespread persistent droughts have resulted in a net global loss of terrestrial productivity. A continued decline in global terrestrial plant productivity potentially threatens food security and future biofuel production and weakens the terrestrial carbon sink, leaving more carbon in the atmosphere. Continuous global monitoring is essential to determine whether the reduced net primary production is a decadal variation or a turning point in terrestrial primary production resulting from a changing climate.

More on this research is available online at *http://www.nasa.gov/topics/earth/features/plant-decline.html*.

Sub-Goal 3B: Understand the Sun and its effects on Earth and the solar system.

Responsible Mission Directorate: Science

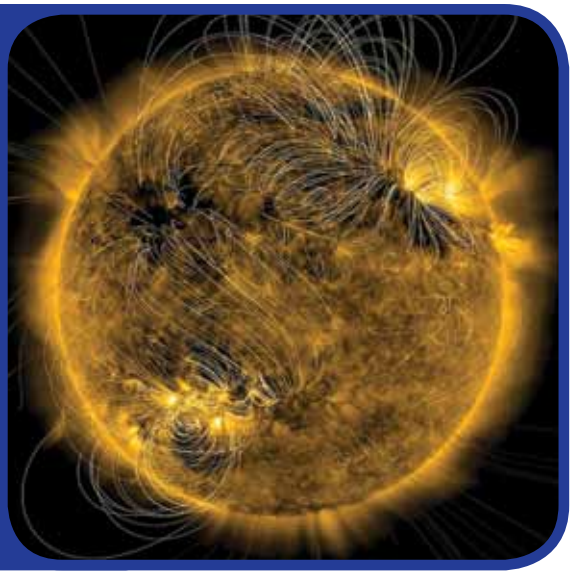
This Highlight achieved in pursuit of Outcome 3B.2 in NASA's FY 2010 Performance Plan Update.

NASA Heliophysics Spacecraft Show the New and Unexpected

Launched in February 2010, the Solar Dynamics Observatory (SDO) is returning images that show never-before-seen detail of material, including energetic particles and radiation, streaming outward and away from sunspots.

This image, taken on August 20, 2010, by SDO, shows that the Sun's corona is threaded with a complex network of magnetic fields. Some field lines are closed (the white lines), not releasing solar wind, and some lines (the gold lines) show open fields, letting solar wind escape. Understanding these magnetic fields is important because it is thought that solar storms and flares,which can affect life on Earth, result from changes in the structure and connections of these fields. The SDO images show the corona's eruptions of superheated gases and intense magnetic fields that are constantly on the move.

Credit: NASA



These immense clouds of material, when directed toward Earth, cause large magnetic storms in the magnetosphere and upper atmosphere. Other images show extreme close-ups of activity on the Sun's surface, revealing how the solar magnetic field is generated in the solar interior and how its structure evolves in the solar atmosphere. SDO's goal is to understand how the magnetospheric storms that the solar variations are able to produce influence life on Earth and humanity's technological systems.

For more on SDO, visit *http://science.nasa.gov/science-news/science-at-nasa/2010/05feb_sdo/*.

Measurements from the older Coupled Ion Neutral Dynamic Investigation (CINDI) have unexpectedly shown that Earth's thermosphere contracted far more than expected during the recent solar minimum in 2009. Solar minimum is the period of the least activity in the 11-year solar cycle, when sunspot and solar flare activity diminishes. The record contraction results from the compound effects of an unusual lull in solar activity combined with enhanced radiative cooling at the upper reaches of Earth's atmosphere due to elevated carbon dioxide levels compared to previous solar minima. The extended solar minimum also has allowed the highest intensity of galactic cosmic rays of the space era to impact the atmosphere, with intensities as much as 20 percent greater than during previous solar minima. Studies of the radiation dose resulting from the enhanced 2009 cosmic ray intensities suggest that NASA and its partners may need to re-evaluate how much radiation shielding astronauts take with them on deep-space missions.

For more on the solar minimum and cosmic rays, visit *http://science.nasa.gov/science-news/science-at-nasa/2009/29sep_cosmicrays/*.

Sub-Goal 3C: Advance scientific knowledge of the origin and history of the solar system, the potential for life elsewhere, and the hazards and resources present as humans explore space.

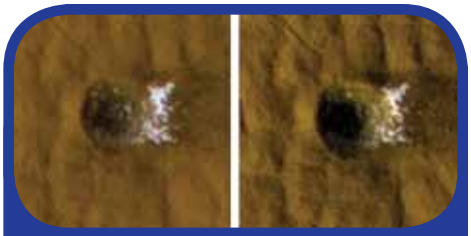
Responsible Mission Directorate: Science

This Highlight achieved in pursuit of Outcome 3C.3 in NASA's FY 2010 Performance Plan Update.

A Warmer, Wetter Mars

While the Mars of today is a world of cold deserts, there is evidence of a warmer and wetter past. Features resembling dry riverbeds and minerals that form in the presence of water indicate water once flowed through Martian sands. Since liquid water is required for all known forms of life, scientists wonder if life could have arisen on Mars, and if it did, what became of it as the Martian climate changed. NASA's Mars Reconnaissance Orbiter (MRO) is helping researchers "follow the water" to determine the possible past, present, and future habitability of Earth's planetary neighbor.

New results from extensive radar mapping of the middle-latitude region of northern Mars show that thick masses of buried ice are quite common beneath protective coverings of dirt and rubble. MRO is charting the locations of these subsurface glaciers and ice-filled valleys, providing clues about how these deposits may have been left as remnants when regional ice sheets sublimated. Researchers hypothesize that the area was covered with an ice sheet during a different climate period, and when the climate dried out, these deposits remained only where they had been protected from the atmosphere. The ice could contain a record of environmental conditions at the time of its deposition and flow, making the ice masses an intriguing possible target for a future mission with digging capability.



Credit: NASA/JPL-Caltech/University of Arizona

This 40-foot-wide crater in mid-latitude northern Mars was created by an impact that occurred between July 3, 2004, and June 28, 2008. The impact that dug the crater excavated water-ice from below the surface, visible as the bright material inside and scattered to the right of the crater.

MRO revealed these glaciers hiding just below the surface of mid-latitude Mars. The spacecraft's observations were obtained from orbit after meteorites excavated fresh craters, revealing the water-ice. The orbiter observed bright ice exposed at five sites with new craters that range in depth from approximately one and a half feet to eight feet. The bright patches darkened in the weeks following initial observations, as the freshly exposed ice vaporized into the thin Martian atmosphere and left behind dust that had been intermixed with the ice. One of the new craters had a bright patch of material large enough for one of the orbiter's instruments to confirm it as water-ice. The findings confirm that water-ice occurs beneath Mars' surface halfway between the north pole and the equator, a lower latitude than expected in the Martian climate.

Sub-Goal 3D: Discover the origin, structure, evolution, and destiny of the universe, and search for Earth-like planets.

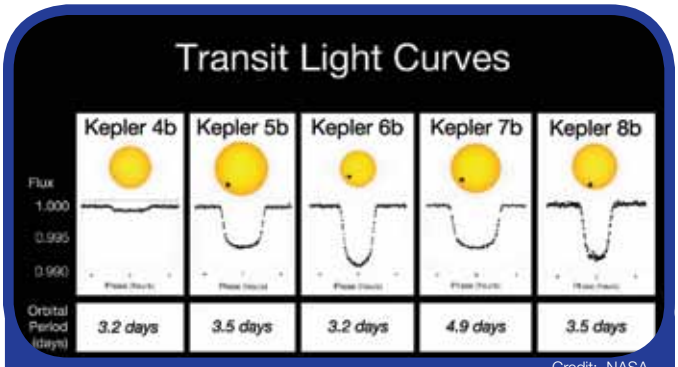
Responsible Mission Directorate: Science

This Highlight achieved in pursuit of Outcome 3D.4 in NASA's FY 2010 Performance Plan Update.

The Search for Earth-like Planets Heats Up

NASA's Kepler Space Telescope, launched in March 2009 to search for Earth-size planets in the habitable zone of sun-like stars, has discovered its first five new exoplanets, or planets beyond Earth's solar system.

Known as "hot Jupiters" because of their large size and extreme temperatures, the new exoplanets (named Kepler 4b, 5b, 6b, 7b, and 8b) range in size from similar to Neptune to larger than Jupiter. They have orbits ranging from 3.3 to 4.9 days, meaning they orbit very close to their parent stars. All the parent stars are hotter and larger than the Sun, and the estimated surface temperatures of the planets range from 2,200 to 3,000 degrees Fahrenheit—hotter than molten lava and much too hot for any known forms of life.



Credit: NASA

When a planet crosses in front of its star as viewed by an observer, it is called a transit. Transits by terrestrial planets produce a small change in the star's brightness—a change that Kepler's sensitive science instrument, or photometer, can detect and measure. From these measurements scientists can determine the size of the distant planet. The five panels show light curves and relative sizes (compared to their parent star) for the five confirmed planets found by Kepler during the first 90 days of operation. Kepler 4b is roughly the size of Neptune, whereas the other four planets are about the size of Jupiter.

Kepler is designed to survey a portion of the Milky Way galaxy to discover extrasolar planets, and these early Kepler discoveries demonstrate the power of the mission to find distant worlds and contribute to the census of extrasolar planets. Over the next three years, Kepler will yield information on the frequency of Earth-sized planets around other stars.

For more information on these discoveries, please visit *http://www.nasa.gov/mission_pages/kepler/news/kepler-5-exoplanets.html*.

Sub-Goal 3E: Advance knowledge in the fundamental disciplines of aeronautics, and develop technologies for safer aircraft and higher capacity airspace systems.

Responsible Mission Directorate: Aeronautics Research

This Highlight achieved in pursuit of Outcome 3E.5 in NASA's FY 2010 Performance Plan Update.

X-48B Takes to the Sky for First Phase Flight Tests

In Spring 2010, a team led by NASA and the Boeing Company completed the first phase of flight tests on the subscale, manta ray-shaped X-48B hybrid wing body aircraft at Dryden Flight Research Center.

Hybrid wing body aircraft configurations are promising candidates to reduce the environmental impact associated with aviation. In the mid-2000s, NASA identified low-speed flight controls as a development challenge for aircraft such as the hybrid wing body. This challenge has been the initial focus of research since then. The ultimate goal is to develop technology for an environmentally friendly aircraft that makes less noise, burns less fuel, and emits less noxious exhaust.

Credit: NASA/T. Landis

NASA Dryden engineer Gary Cosentino prepares the X-48B for flight.

The first phase began on July 20, 2007 and ended with the 80th flight on March 19, 2010. The flight test program utilized a composite-skinned, 8.5 percent scale model of the X48-B that can to fly up to 10,000 feet and 120 knots in its low-speed configuration. A pilot flies the aircraft remotely from a ground control station using conventional aircraft controls and instrumentation, while looking at a monitor fed by a forward-looking camera on the aircraft.

Sub-Goal 3F: Understand the effects of the space environment on human performance, and test new technologies and countermeasures for long-duration human space exploration.

Responsible Mission Directorates: Exploration Systems and Space Operations

This Highlight achieved in pursuit of Outcome 3F.4 in NASA's FY 2010 Performance Plan Update.

VCAM Provides a Breath of Fresh Air on the ISS

Keeping astronauts healthy and productive in space goes beyond medicine and exercise. It includes technologies that protect crewmembers while remaining practical and comfortable to use. NASA continuously strives to develop technologies that will make exploration safer. The Vehicle Cabin Atmosphere Monitor (VCAM), which identifies gases that are present in minute quantities in the ISS breathing air that could harm the crew's health, is one such technology. In the future, instruments like VCAM could accompany crewmembers during long-duration exploration missions. To successfully live and work in the environment of the ISS, the environment must be monitored to ensure the health of the crewmembers. Crewmembers can be more sensitive to air pollutants because of the closed environment. The impact of pollutants in this environment are magnified because the exposure is continuous. VCAM can provide a means for monitoring the air within enclosed environments, such as the ISS, Crew Exploration Vehicle (CEV), or other vehicle traveling throughout the solar system. Its miniature preconcentrator, gas chromatograph, and mass spectrometer can provide unbiased detection of a large number of organic

species. VCAM's software can identify whether the chemicals are on a targeted list of hazardous compounds and their concentration. The performance and reliability of VCAM on orbit along with the ground teams assessment of its raw data and analysis results will support the development of this technology in the future.

For more on NASA's research to keep astronauts healthy and productive, go to *http://humanresearch.jsc.nasa.gov* and *http://www.nasa.gov/exploration/analogs/index.html*.

Strategic Goal 4: Bring a new Crew Exploration Vehicle into service as soon as possible after Shuttle retirement.

Responsible Mission Directorate: Exploration Systems

This Highlight achieved in pursuit of Outcome 4.1 in NASA's FY 2010 Performance Plan Update.

Ares I-X Completes a Successful Flight Test

The Ares I-X test rocket lifted off on October 28, 2009, from Kennedy Space Center for a two-minute powered flight, the first time that NASA's new 327-foot-tall launch vehicle had flown. The flight test, which launched from the newly modified Launch Complex 39B, lasted about six minutes until splash-down of the rocket's booster stage nearly 150 miles down-range. The successful flight test capped its easterly trajectory at a suborbital altitude of 150,000 feet.

After the separation of its first stage, a four-segment solid rocket booster, parachutes deployed for recovery of the booster and the solid rocket motor. The test launch met all its primary goals and provided a solid foundation for future rockets. The flight's only flaw came after the first stage burned through its fuel and separated from the dummy upper stage. One of the three main parachutes collapsed entirely during the fall to the ocean and a second partially collapsed, most likely because the device that cuts the reefing lines activated earlier than planned. A number of lessons were learned from the Ares I-X experience.

Engineers of future rockets can incorporate a number of policies, techniques, and experiences, to support quick maturation from concept to operational launcher of the next generation of American spaceflight vehicles that could transport humans beyond low Earth orbit.

For more on the Ares I-X test flight, go to *http://www.nasa.gov/mission_pages/constellation/ares/flighttests/aresIx/index.html*.

Credit: NASA/S. Joseph and K. O'Connel

NASA's Ares I-X test rocket soars into blue skies above Launch Pad 39B at NASA's Kennedy Space Center in Florida on October 28, 2009.

Strategic Goal 5: Encourage the pursuit of appropriate partnerships with the emerging commercial space sector.

Responsible Mission Directorates: Exploration Systems and Space Operations

This Highlight achieved in pursuit of Outcome 5.1 in NASA's FY 2010 Performance Plan Update.

NASA Ensures Launch Options

In September 2010, NASA awarded new launch services contracts to four commercial companies to ensure NASA's access to a broad range of launch services over a ten-year period. Through these contracts, the Agency will have a variety of launch options for NASA's planetary, Earth-observing, exploration, and scientific satellites and will also be able to provide launch services to other government agencies, such as the National Oceanic and

Atmospheric Administration. NASA has the ability to order up to 70 launch services missions with a maximum cumulative potential contract value of $15 billion.

NASA selected the following companies: Lockheed Martin Space Systems Company for the Athena I and Athena II; Orbital Sciences Corporation for the Pegasus XL and Taurus XL; United Launch Services, LLC for the Atlas V, and Space Exploration Technologies (SpaceX) for the Falcon 1, 1e and 9 launch vehicles.

Although the new contract lasts for ten years, an annual opportunity exists for launch service providers to submit proposals offering new launch services unavailable at the time of this award, thus enhancing the competitive nature of the contract over the full ten-year contract life. NASA's Launch Services Program continues to engage emerging launch service providers, both on and off the contract, to provide expertise and to encourage the successful growth of a competitive market.

In 2010, SpaceX and Orbital continued to make progress under the signed Commercial Orbital Transportation Systems (COTS) Space Act Agreements and toward the signed Commercial Resupply Services (CRS) contracts to provide cargo resupply for the ISS.

On June 4, 2010, the SpaceX Falcon 9 rocket lifted off from Kennedy Space Center on its maiden flight. The Falcon 9 rocket successfully achieved its intended 155-mile-high orbit, fulfilling all mission objectives. This successful test by SpaceX is an important benchmark toward the launching of an active Dragon spacecraft on SpaceX's first COTS demonstration mission scheduled for November 2010.

Strategic Goal 6: Establish a lunar return program having the maximum possible utility for later missions to Mars and other destinations.

Responsible Mission Directorates: Exploration Systems and Space Operations

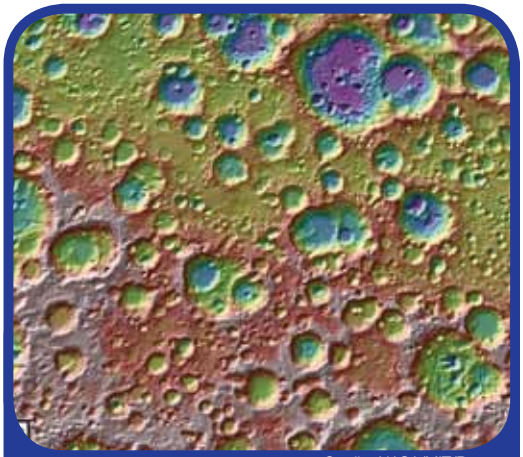
This Highlight achieved in pursuit of Outcome 6.4 in NASA's FY 2010 Performance Plan Update.

LRO Reveals New Moon

The instruments on LRO have supported the ability to study the Moon at a number of different scales, from the Moon as a whole, to regional variations, to discoveries at specific locations. The three papers published in the September 17, 2010, issue of the journal *Science* are examples of NASA's ability to gain intriguing new knowledge of the Moon over each of these different spatial scales.

The topographic data acquired from LRO's Lunar Orbiter Laser Altimeter (LOLA) provided significant new scientific insight into the early history and evolution of the Moon that will also influence understanding of the early days of Earth. Using the high resolution altimetry data, a new catalog of all craters on the Moon with a diameter of greater than 20 kilometers was created, and a new perspective on the Moon's turbulent and violent youth has been developed.

Global scale information about mineralogy of the Moon typically comes from analysis of the light from the Sun that is reflected from the Moon's surface. The measurements delivered from LRO use infrared (longer wavelength than visible) light that is emitted by the Moon and is characteristic of its composition. LRO's data has revealed the presence of silica-rich lunar soils at scales of a kilometer and larger. There is also evidence of granite-like formations as well as regions where quartz and silica-rich glass are found. These emissions have also confirmed the pristine lunar mantle is not exposed at the lunar surface at the kilometer scale. The observations provide compelling evidence that the Moon is a complex body that has experienced a wide range of volcanic-like processes. Before LRO's launch, it was common to think the Moon was comprised of two different kinds of areas, the dark lunar seas and the brighter highlands areas. Now, with the



Credit: NASA/MIT/Brown

This lunar topographic map showing one of the most densely cratered regions on the Moon. The topography is derived from over 2.4 billion shots made by LOLA. Colors indicate increasing elevation from blue to red.

exquisite measurements made with LRO, details indicate that things are much more complicated and a lot more interesting.

For more on this story, including more images, go to *http://www.nasa.gov/mission_pages/LRO/news/turbulent-youth.html*.

Other Agency Successes

Education

This Highlight achieved in pursuit of Outcome ED.2 in NASA's FY 2010 Performance Plan Update.

A Summer of Innovation

NASA piloted the Summer of Innovation project in 2010 to engage students in science, technology, engineering, and mathematics (STEM) disciplines through out-of-school learning activities. State education stakeholders, NASA Field Centers, and other education partners offered STEM-related special events, teacher development, and family activities throughout the summer.

One goal of the Summer of Innovation was to increase the participation of low-income and minority students. The Idaho Space Grant, one of four organizations to receive NASA support for a statewide initiative, collaborated with three universities and a tribal college to better reach minority students from the states of Idaho, Montana, and Utah. Junior high students and teachers from tribal reservations and migrant Latino families participated in engaging activities in rocketry, robotics, cosmology, and Earth science. One parent commented, "[My son] looked forward to each and every single day, and has just now started talking about college and a possible future within NASA."

NASA Field Centers hosted many student and teacher focused events. The Teaching From Space Project at Johnson Space Center offered student design challenges and opportunities for students to showcase their work to their parents. The Langley Research Center hosted some activities specifically designed for homeschoolers and reached more than 1,500 students. The Jet Propulsion Laboratory hosted a large event that included visits by astronauts, music celebrities, and a number of education workshops for students. The Glenn Research Center collaborated with the Cincinnati Public Schools for a summer learning session and a series of activities that enabled interactions between students and NASA scientists and engineers.

Although the impact of the Summer of Innovation is still being assessed, the summer pilot engaged more than 78 thousand students through summer learning sessions. The program also implemented more than 150 events led by 130 participating partners at NASA Field Centers across the Nation. The story, however, is bigger than just numbers. Currently, NASA is planning a second Summer of Innovation, to continue the strides made in the summer of 2010 and to hopefully pave the way for students, parents, and teachers to engage in a lifetime of learning.

Credit: NASA

Student involvement encompasses both one-time, short duration enrichment activities and long-term, or sustained learning. In 2010, NASA piloted the Summer of Innovation projects, designed to increase engagement opportunities for middle school students.

Diversity and Equal Opportunity

This Highlight achieved in pursuit of Outcome AS.2 in NASA's FY 2010 Performance Plan Update.

New Process Addresses Harassment

In FY 2010, NASA deployed an Agency process, one of the first of its kind in the Federal government, devoted solely to addressing allegations of harassment. The new process further strengthens NASA's commitment to being a workplace free of harmful and sometimes unlawful conduct. The process is specifically designed to ensure that the Agency handles and resolves allegations of harassing conduct at the earliest possible opportunity. This is an important means of preventing unlawful discrimination as harassment that becomes severe and pervasive and is a form of discrimination under the law. The new procedures create the role of Center Anti-Harassment Coordinator, an individual charged with receiving allegations of harassment, monitoring the process from start to finish, and reporting annually on the number of allegations received and time in inventory. The new process calls for a prompt fact-finding into the matter and a decision by the appropriate management official as to the allegation and whether any additional action should be taken. Under the new process, it is expected that the time elapsed from allegation to decision on the matter will normally be 2-4 weeks, barring extenuating circumstances.

NASA Surveys Workforce About Diversity and Inclusion

In FY 2010, NASA deployed a first-ever Agency-wide Diversity and Inclusion Survey to evaluate employee perceptions on a host of diversity-inclusion issues such as the extent to which employees believe the Agency is transparent in its policies and the dissemination of critical information, and whether employees believe they are being treated fairly in the allocation of career enhancing opportunities. This knowledge of current perceptions of the workforce is critical in shaping NASA's long-term diversity-inclusion effort. NASA's survey will conclude in the first quarter of FY 2011. The Agency is eager to analyze the results to improve diversity and inclusion throughout NASA.

Bringing Attention to Equal Opportunity in STEM

In FY 2010, NASA completed dissemination of the publication "Title IX and STEM: Promising Practices for Science, Technology, Engineering, and Technology" to grant recipients." Since its issuance, this publication has been recognized by civil rights agencies, advocacy groups, and academia as a milestone in efforts to draw attention to and provide useful guidance to educational institutions on ensuring equal opportunity regardless of gender in STEM programs, where the numbers of women students remain low in a number of critical fields.

For more information, visit NASA's Office of Diversity and Equal Opportunity at *http://odeo.hq.nasa.gov/index.html*.

Verification and Validation of NASA's Performance Information

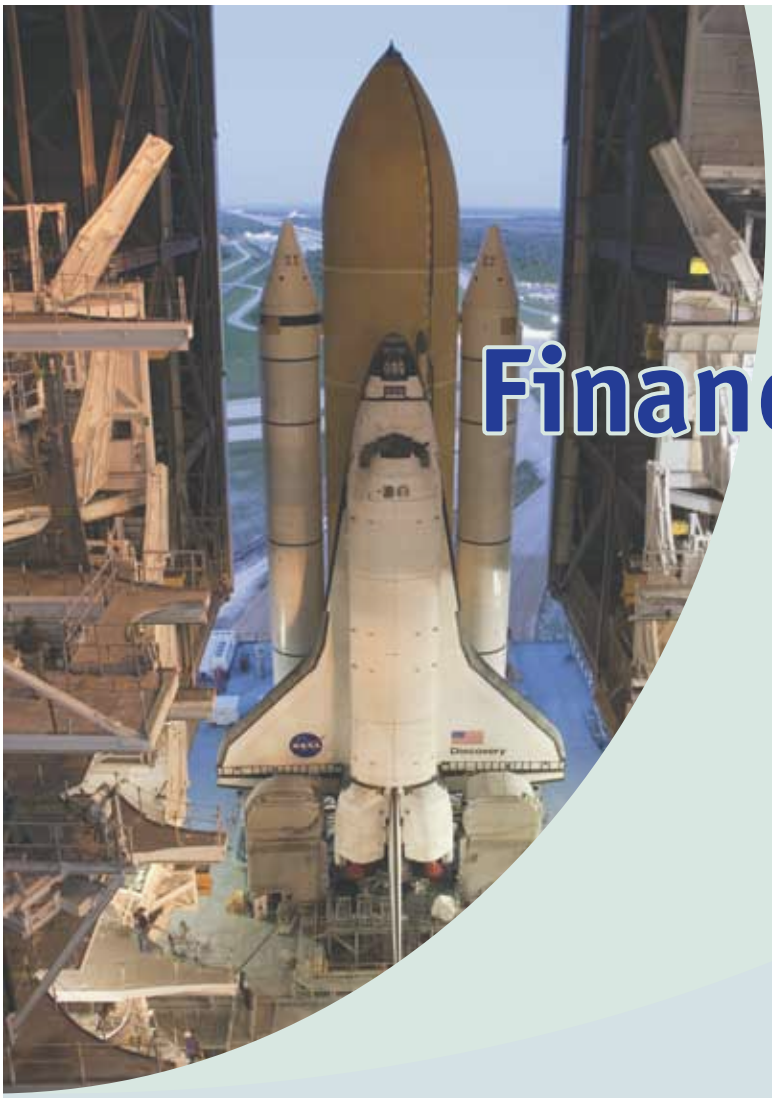
NASA verifies and validates its performance data to assure Congress and the public that reported performance information is credible. Verification and validation processes ensure that performance goals are measurable, with a direct connection to an Agency's mission, and that performance data is accurate, complete, consistent, and current. NASA has verified and validated that the Agency's Mission Directorates and Mission Support Offices have procedures in place for collecting, maintaining, and processing accurate GPRA performance data.

Each Mission Directorate and Mission Support Office has a process in place for assessing performance and assigning ratings to their Outcomes and APGs. NASA program officials enter supporting performance information into a secure Web-based system, which stores the information during and after the annual performance reporting process. Analysts within NASA's Strategic Investments Division (SID) in the Office of the Chief Financial Officer conduct additional reviews and evaluations of reported performance data to assess whether the information submitted by the Mission Directorates and Mission Support Offices is consistent with information reported at other internal reviews and complete enough to portray an accurate picture of NASA's performance.

In FY 2010, SID surveyed the Mission Directorates and Mission Support Offices on their verification and validation procedures via the secure Web-based system during the annual PAR data collection process. The survey required Mission Directorate and Mission Support Office officials to provide information about their processes for rating program performance, and maintaining and verifying data. Best practices identified during this process include holding monthly, biennial, and quarterly project and program reviews, with input from internal review boards, external advisory boards, and subject matter experts. Collaboration between Mission Directorates and Mission Support Offices ensures that the proper performance information is being shared throughout the Agency. Documentation utilized includes white papers, meeting minutes, meeting or conference presentations, letters and memos, a record of online correspondence, surveys, and spreadsheets and databases.

The Innovative Partnerships Program (IPP) offers an example of one office's thorough verification and validation process. All IPP program metrics are targeted to IPP's APGs and are compiled continuously in IPP's National Technology Transfer System (NTTS), which is a management information system that is utilized to compile key quantitative and qualitative information on licensing, partnership, patenting, and license fees/royalties activities. It includes success story information regarding commercial application of technologies transferred out of the Agency, as well as data regarding partnership joint technology development and infusion of these technologies into NASA's missions. SBIR/STTR, technology transfer, and partnership technology development success stories are verified directly with external entities. Further, NASA's Statement of Assurance annual process involves external, independent auditing of evidence provided by IPP to ensure that the program is meeting its mission objectives. IPP's program activity and achievements are documented almost continuously throughout the year on IPP's Web site at *http://www.nasa.gov/offices/ipp/home/index.html*.

Inage, Chapter first page (page 9): The Antennae galaxies, located about 62 million light-years from Earth, are shown in this composite image from the Chandra X-ray Observatory (blue), the Hubble Space Telescope (gold and brown), and the Spitzer Space Telescope (red). The Antennae galaxies take their name from the long antenna-like arms seen in wide-angle views of the system. These features were produced in the collision. (Credit: NASA/CXC/SAO/JPL-Caltech/STScI)



Financial Results

This section analyzes and discusses NASA's Financial Statements and its stewardship of the resources provided to it by Congress to carry out its mission. The Financial Statements, which present the results of NASA's operations and financial position, are the responsibility of NASA's management.

NASA's financial statements and accompanying notes are presented in their entirety in the *Financials* section. NASA prepares the Consolidated Balance Sheet, Consolidated Statement of Net Cost, Consolidated Statement of Changes in Net Position and Combined Statement of Budgetary Resources, which provide the financial results of operations. This overview focuses on the key information provided in the statements, which describes NASA's stewardship of the resources provided to it by Congress to carry out its mission.

Financial Highlights

Results of Operations

NASA's net cost of operations for FY 2010 was $21.3 billion, a decrease of $1.2 billion, or five percent compared to FY 2009. This decrease primarily represents lower depreciation in FY 2010 due to the reduction of assets for the

On September 20, 2010, Space Shuttle *Discovery* begins its nighttime trek, known as "rollout," from the Vehicle Assembly Building to Launch Pad 39A. It will take the Shuttle, attached to its external fuel tank, twin solid rocket boosters and mobile launcher platform, about six hours to complete the move atop a crawler-transporter.

International Space Station (ISS) and Space Shuttle (SS) in late FY 2009. Most of NASA's Research and Development and Other Initiatives (R&D/Other) emphasized programs essential to achieving various strategic goals.

NASA's programs and activities are carried out through four R&D/Other initiatives: Aeronautics Research, Exploration Systems, Science, and Space Operations. The Consolidated Statement of Net Cost presents NASA's net costs by R&D/Other initiatives, which is summarized in the table below. The net cost of operations is the gross cost incurred by NASA, less any earned revenue for work performed for other government organizations and the public.

Space Operations and Science were NASA's largest expenditures in FY 2010 at $9.3 billion and $6.0 billion, respectively. The accompanying table provides net cost comparisons for FY 2010 and FY 2009 across the four major initiatives.

Cost by Research and Development and Other Initiatives
(In Millions of Dollars)

R&D/Other Initiatives	Audited 2010	Unaudited 2009	% Change
Aeronautics Research			
Gross Costs	$ 816	$ 828	-1%
Less: Earned Revenue	119	113	5%
Net Costs	697	715	-3%
Exploration Systems			
Gross Costs	5,360	5,153	4%
Less: Earned Revenue	62	33	88%
Net Costs	5,298	5,120	3%
Science			
Gross Costs	6,697	6,606	1%
Less: Earned Revenue	649	616	5%
Net Costs	6,048	5,990	1%
Space Operations			
Gross Costs	9,694	11,070	-12%
Less: Earned Revenue	429	428	0%
Net Costs	9,265	10,642	-13%
Net Cost of Operations			
Gross Costs	22,567	23,657	-5%
Less: Earned Revenue	1,259	1,190	6%
Net Costs	**$ 21,308**	**$ 22,467**	-5%

A significant portion of the decrease in net costs relates to general costs for goods and services used in operations across NASA programs, with the majority for the ISS. Remaining costs are allocated to R&D/other initiatives.

Aeronautics Research net costs decreased $18 million or three percent in FY 2010. Significant progress was made towards implementing the Next Generation Air Transportation System (NextGen), which is intended to yield revolutionary concepts, capabilities and technologies that will enable improvements in air vehicles and air traffic management.

Exploration Systems net cost was $178 million or three percent higher in FY 2010 primarily due to activity in the Constellation Program. In 2010, the Agency moved forward on existing program initiatives primarily focused on the Orion Crew Exploration Vehicle and the Ares 1 projects. The Orion crew exploration vehicle took shape as the two halves of the crew module were fused together. New efforts were taken to design, build and test the next generation human spacecraft Orion, including the construction of a crew module that will be used in flight-like environment testing on the ground. The Ares 1 project completed the first stage avionics, upper stage roll control systems and the launching for the Ares 1-X flight test.

Science net cost increased $58 million in FY 2010. This change of one percent primarily reflects planned acceleration of Earth Science, Decadal Survey Tier-1 missions, Soil Moisture Active-Passive, Ice, Cloud and Land Elevation Satellite 2, and the addition of a thermal infrared instrument to the Landsat Data Continuity Mission (LDCM), as well as planned fluctuation of costs for various other missions.

Space Operations net cost decreased $1.4 billion or thirteen percent in FY 2010. This is primarily due to the reduction of ISS and SS assets in late FY 2009 which resulted in lower depreciation. All SS missions will be completed by the end of FY 2011, after which the SS orbiters are scheduled to be retired. Space Operations completed activities to sustain engineering support and provide vehicle replacement spare parts, which will be essential once the Shuttle orbiters have been retired as there will not be return or repair capability. Space Operations also made significant progress on the Tracking and Data Relay Satellite (TDRS) Replenishment project to replenish the aging fleet of communications spacecraft in the space network.

Sources of Funding

NASA receives funds to support its operations primarily through congressional appropriations. NASA's total budgetary resources during FY 2010 totaled $21.5 billion, of which $1.3 billion is the unobligated balance brought forward from FY 2009. NASA's budgetary funding and use of funds is summarized in the table below.

Budgetary Resources
(In Millions of Dollars)

Line Item	Audited 2010	Unaudited 2009	% Change
New Budget Authority	$ 18,725	$ 17,784	5%
American Recovery and Reinvestment Act	4	1,050	-100%
Unobligated Balance Brought Forward	1,320	994	33%
Other Resources	1,460	1,673	-13%
Total Budgetary Resources	**$ 21,509**	**$ 21,501**	**0%**
Total Obligations Incurred	20,894	20,181	4%
Total Unobligated	**$ 615**	**$ 1,320**	**-53%**

New Budget Authority which represents eighty-seven percent of NASA's total budgetary resources during FY 2010, was provided by Congress primarily through two-year appropriations. In FY 2010, the Agency's appropriations increased by $941 million. NASA received $1,050 million of Recovery Act funding in fiscal year 2009 ($1,002 million Direct Appropriation and $48 million Reimbursable Authority), all of which has been obligated on projects to support the Nation's economic recovery and advance NASA's research mission. The Agency received an additional $4 million in Reimbursable Authority in FY 2010. NASA has completed all awards of Science, Exploration, Aeronautics, and Cross-Agency contracts and cooperative agreement proposals in accordance with applicable Program Plans and Recovery Act provisions, and almost seventy percent of funds appropriated have been disbursed for those projects. The Agency's progress on Recovery Act objectives is detailed in the table below. Details on NASA's progress are available at the following Web sites: *http://www.nasa.gov/recovery/index.html* and *http://www.nasa.gov/pdf/486292main_main_NASA_Weekly_and_Activity_Report_20100930.pdf*.

American Recovery and Reinvestment Act of 2009

(In Millions of Dollars)

Operation	Funding	ARRA Objectives	Obligations	Gross Outlays	Major Completed Actions
Science	$400	• To accelerate the development of the Tier 1 set of Earth Science climate research missions recommended by the National Academies Decadal Survey. • To increase the Agency's supercomputing capabilities.	$400	$309	$325 million of Recovery Act funds were applied to the Earth Science Program to conduct breakthrough research to advance fundamental knowledge on the most important scientific questions on the global and regional integrated Earth system. Activities encompass the global atmosphere; the global oceans including sea ice; land surfaces including snow and ice; ecosystems; and interactions between the atmosphere, oceans, land, and ecosystems. A balanced investment was made between all of the elements of the overall NASA Earth Science Program, including the spaceflight missions, technology development, research and analysis, and science applications. Recovery Act funds were used to accelerate the implementation of the recommendations of the National Research Council's Earth Science and Applications Decadal Survey (2007). This includes rapid deployment of a suite of Earth-observing satellites to leverage existing missions and provide cutting-edge measurements of key parameters relevant to climate change while preserving the balance discussed in the paragraph above. NASA also expended $75 million on the James Webb Space Telescope, within the Astrophysics Program, to maintain current workforce levels and increase the likelihood that it will launch on the planned date. Recovery Act funds were applied to spacecraft development activities including design and fabrication of key component systems. This important observatory will examine every phase of cosmic history: from the first luminous glows after the big bang to the formation of galaxies, stars, and planets to the evolution of our own solar system.
Exploration Systems	$400	• Fund planned mission development activities that could contribute to future exploration. • Stimulate efforts within the private sector to develop and demonstrate human spaceflight capability.	$400	$304	NASA invested $400M in Recovery Act funding for Exploration programs including the Constellation Systems Program, the Commercial Crew and Cargo Program, and the Dual Use Initiative. Each project had a uniquely identified scope of work to be completed during the FY 2009-2010 fiscal years. The Constellation Program used Recovery Act funds to supplement and enhance the planned scope of work efforts. NASA's Commercial Crew and Cargo Program (C3PO) invested financial and technical resources within the private sector to develop and demonstrate safe, reliable, and cost-effective space transportation capabilities to and from low Earth orbit (LEO). This investment of ARRA funds, allowed for the performance of risk reduction tasks for potential commercial crew capabilities. The Dual Use Initiatives used ARRA funds to accelerate development of a docking system to be used on the ISS, to enable dockings of various spacecraft vehicles. These funds also stimulated efforts within the private sector that will benefit dual use (government/commercial) launch site and test infrastructure, to provide long term benefits to the nation's launch vehicle development and services infrastructure.
Aeronautics Research	$150	• To undertake systems-level research, development and demonstration activities related to: - Aviation safety - Environmental impact mitigation - The Next Generation Air Transportation System (NextGen).	$150	$30	NASA invested $150 million of Recovery Act funds, into the existing Aeronautics Research Program, to enhance and expand the fidelity of current foundational research activities; ensure the availability of aeronautical test facilities; and conduct integrated system level research activities supporting NextGen. NASA's Aeronautics Research Program is comprised of four programs: Airspace Systems, Fundamental Aeronautics, Aviation Safety, and Aeronautics Test. Research in all programs was accelerated and enhanced through Recovery funds. Numerous awards were made across industry, academia and to non-profits to accelerate research in advanced aircraft technologies and systems, aircraft safety, fuel efficiency, and the Next Generation Air Transportation System. This research will lead to a safer, more environmentally friendly, and more efficient national air transportation system.

Operation	Funding	ARRA Objectives	Obligations	Gross Outlays	Major Completed Actions
Cross Agency Support	$50	• Reimbursable funds to meet different agency's Recovery Act objectives.	$50	$44	These funds addressed needed repairs of facilities important to NASA's human spaceflight missions, at the Johnson Space Center in Houston, Texas. Repairs were conducted on roofs on more than 20 buildings, exterior panels on 36 different buildings, and loggia ledges on 11 buildings. Added to these repairs, approximately 2360 windows, 100+ street/parking/sidewalk lights, and greater than 200,000 linear feet (nearly 40 miles!) of caulking was replaced. Over 1,000,000 sq ft (over 23 acres!) of building panels were cleaned and waterproofed. To complete this work, more than 85 percent of the new contracts were awarded to 8(a) companies.
Cross Agency Support	$52	• Reimbursable funds to meet different agency's Recovery Act objectives.	$52	$28	Other federal agencies, including the National Oceanic and Atmospheric Administration (NOAA) and the Department of Energy (DOE) provided NASA with reimbursable funds to meet the goals of their Recovery Act activities. Of note the NOAA-provided funds were awarded for development of climate sensors.
Inspector General	$2	• To provide oversight of NASA's implementation and execution of the Recovery Act and the requirements of the Office of Management and Budget's implementing guidance.	*	*	NASA's Office of Inspector General (OIG) continues to monitor the Agency's compliance with the accountability and transparency provisions of the Recovery Act and OMB's implementing guidance. To do this, the OIG has and continues to: 1) review NASA's processes for controlling Recovery Act funds and awarding associated agreements and contracts; and 2) review programs and projects funded under the Recovery Act to assess cost and schedule performance, achievement of key milestones, and compliance with OMB's implementing guidance. The OIG continues to identify new areas of review in an effort to increase its oversight of NASA's Recovery Act funding. During this period, the OIG conducted work at four field Centers and Headquarters and audited more than 40 contract actions and one cooperative agreement. Further, reviews were conducted of NASA's Recovery Act Agency and Program Plans to assess compliance with OMB implementation guidance, in addition to a review of NASA's open audit recommendations that could impact the Agency's successful implementation of the Recovery Act.
Total	**$1,054**		**$1,052**	**$715**	

*The Inspector General has amounts just below the displayable threshold of a million dollars.

Other Resources include funding received for sharing NASA technology and services provided to other Federal agencies and public entities, and recoveries of budgetary resources that were obligated in a previous year. Other Resources increased by one percent in FY 2010 primarily for work performed for other government agencies, such as the Department of the Air Force for TDRS, the National Oceanic and Atmospheric Administration (NOAA) for the Polar Operational Environmental Satellites (POES) and Geostationery Operational Environmental Satellite (GOES) projects.

Obligations Incurred represents NASA's use of $20.9 billion of available budgetary resources to accomplish the Agency's goals within its four R&D/Other initiatives. Obligations Incurred increased by four percent between FY 2010 and FY 2009.

Balance Sheet

Assets

Total assets as of September 30, 2010 were $18.3 billion, a decrease of $5.4 billion compared to September 30, 2009. NASA's assets are divided into four categories, as described in the table below.

NASA Assets
(In Millions of Dollars)

Line Item	Audited 2010	Unaudited 2009	% Change
Property, Plant & Equipment	$ 9,635	$ 11,577	-17%
Fund Balance with Treasury	8,601	8,854	-3%
Inventory	—	3,019	-100%
Other Assets	92	235	-61%
Total Assets	**$ 18,328**	**$ 23,685**	**-23%**

NASA's largest category of assets is **Property, Plant and Equipment** (PP&E), which decreased seventeen percent or $1.9 billion in FY 2010. This decrease is due to the completion of the Shuttle Program and a decrease in the Assets Under Construction (AUC) due to the ISS nearing completion.

Fund Balance with Treasury (FBWT) which represents NASA's cash balance at the Department of Treasury, decreased by three percent or $253 million. This change primarily represents net outlays that occurred during FY 2010 related to Recovery Act objectives.

Inventory and Related Property historically consists of operating materials and supplies (OM&S). During FY 2009, NASA utilized the consumption method of accounting for OM&S. However during FY 2010, the ISS construction and SS contracts were concluding. As a result, the OM&S related to these contracts, which comprised approximately eighty-eight percent of the balance, was decreasing. Given this fact as well as flexibility given to management by the Statement of Federal Financial Accounting Standard (SFFAS) No. 3, Accounting for Inventory and Related Property, management elected to adopt the purchases method of accounting which allows the expensing of OM&S.

Other Assets includes Investments of $18 million and Accounts Receivables of $71 million in FY 2010. Accounts Receivable decreased by $147 million due to the completion of work performed for the Department of the Air Force TDRS and Automatic Collision Avoidance Technology (ACAT) projects.

Liabilities

Total liabilities as of September 30, 2010 were $4.3 billion, an increase of $164 million compared to September 30, 2009. The major categories of liabilities are detailed in the table below.

NASA Liabilities
(In Millions of Dollars)

Line Item	Audited 2010	Unaudited 2009	% Change
Accounts Payable	$ 1,462	$ 1,384	6%
Other	1,755	1,786	-2%
Environmental and Disposal Liabilities	1,041	922	13%
Federal Employee and Veterans Benefits	55	57	-4%
Total Liabilities	**$ 4,313**	**$ 4,149**	**4%**

Accounts Payable represents amounts owed to other entities for goods and services received. Compared to the prior year, the FY 2010 balance increased by $78 million. This is due to an increase in obligations incurred during the year.

Other Liabilities represents estimated contractor costs incurred but not yet paid, as well as contingent liabilities for litigation claims, accrued payroll and related costs as well as NASA's liability for advances and prepayments, which remained consistent between the years.

Environmental and Disposal Liabilities are estimated cleanup costs for actual or anticipated contamination from waste disposal methods, leaks, spills, and other NASA activity that created, or could create, a public health or environmental risk, and cleanup costs associated with the removal, containment, and/or disposal of hazardous

wastes or material and/or property. In FY 2010, NASA recorded an additional $119 million dollars of environmental and disposal liabilities to reflect the estimated total cost of environmental cleanup on known hazardous conditions bringing the total to $1,041 million which includes anticipated cleanup at disposal for Space Shuttle and PP&E. The amount recorded in FY 2009 was $922 million. The increase is due to changes in individual project estimates and additional liabilities from disposal-related cleanup costs for PP&E.

Federal Employee and Veteran Benefits are amounts that the Department of Labor estimates on behalf of NASA for future worker's compensation liabilities for current employees. The estimate for future worker's compensation benefits includes the expected liability for death, disability, medical and miscellaneous costs for approved compensation cases, plus a component of incurred but not reported claims.

Net Position

Net Position represents the sum of Cumulative Results of Operations (CRO) and Unexpended Appropriations, which is the current value of NASA's assets less its liabilities. During FY 2010, NASA adopted a change in accounting principle which reduced the beginning balance of the CRO by $3.0 billion. This change in accounting principle, coupled with the reclassification of SS assets as well as Work-in-Process to expenses in FY 2010, caused Net Position to decrease by $5.5 billion during FY 2010.

NASA Net Position
(In Millions of Dollars)

Line Item	Audited 2010	Unaudited 2009	% Change
Unexpended Appropriations	$ 5,706	$ 6,128	-7%
Cumulative Results of Operations	8,309	13,408	-38%
Total Net Position	**$ 14,015**	**$ 19,536**	**-28%**

Credit: NASA

A member of the ISS Expedition 22 crew photographed the silhouette of Space Shuttle *Endeavour* on February 9, 2010, as it approached the Station for docking. The orange layer is the troposphere, where weather and clouds are typically generated and contained. This orange layer gives way to the whitish stratosphere, then into the mesosphere, and finally the blackness of space.

Systems, Controls, and Legal Compliance

Management Assurances

Administrator's Statement of Assurance

November 15, 2010

NASA management is responsible for establishing and maintaining effective internal controls and financial management systems that meet the objectives of the *Federal Managers' Financial Integrity Act* (FMFIA), as well as related laws and guidance. NASA is committed to a robust and comprehensive internal control program. We recognize that ensuring the effective, efficient, and responsible use of the resources that have been provided to the Agency is not only good stewardship, but also the right approach to maximizing our progress toward the realization of our goals. Within the Agency, I have made it clear that I am responsible for establishing and maintaining a sound system of internal control. In turn, I have made these responsibilities clear to my program management, mission support offices, and Center management—and they have communicated this responsibility to their subordinates. As a result, managers and employees throughout the Agency are active on a daily basis in identifying or updating key control objectives, assessing risks, implementing controls or other mitigating strategies, conducting reviews, and taking corrective actions as necessary.

I am very pleased to report that in FY 2010, the NASA Office of the Chief Financial Officer (OCFO) has implemented sufficient corrective actions to resolve the one remaining FY 2009 prior year material weakness—Asset Management: Valuing Legacy Property, Plant, and Equipment. OCFO's extensive work in collaboration with the Office of the Inspector General and the independent financial statement auditor confirmed that NASA's treatment of its legacy assets is in compliance with the Statements of Federal Financial Accounting Standards (SFFAS) 35, *Estimating the Historical Cost of General Property, Plant, and Equipment*. OCFO conducted extensive

analysis of its legacy assets and estimation methodology to demonstrate the validity of the approach in compliance with SFFAS 35. OCFO kept the Office of the Inspector General and independent financial statement auditors fully informed throughout FY 2010 and incorporated their input on planned activities to develop a reasonable valuation estimate for legacy assets. OCFO met the key objectives necessary for valuing legacy assets. As a result of NASA's efforts and the corrective actions taken, NASA concludes that the one remaining FY 2009 prior year material weakness is resolved.

NASA conducted its assessment of the effectiveness of internal controls over operations and compliance with applicable laws and regulations in accordance with OMB Circular A-123, *Management's Responsibility for Internal Control*. Based on the results of this evaluation, NASA can provide reasonable assurance that its internal controls over the effectiveness and efficiency of operations and compliance with applicable laws and regulations as of September 30, 2010, were operating effectively and no material weaknesses were found in the design or operation of the internal controls. NASA is also in conformance with Section 4 of FMFIA.

In addition, NASA conducted its assessment of the effectiveness of internal controls over financial reporting, which includes safeguarding of assets and compliance with applicable laws and regulations, in accordance with the requirements of OMB Circular A-123, Appendix A, *Internal Control over Financial Reporting*. OCFO follows a risk-based approach in determining the business cycles to be assessed during the current year. During FY 2010, the Property Management Cycle was reviewed. No new material weaknesses were identified as a result of the work performed. Based on the results of this evaluation, NASA makes an unqualified statement of assurance that its internal controls over financial reporting as of June 30, 2010, were operating effectively and no material weaknesses were found in the design or operation of the internal controls over financial reporting.

In accordance with the requirements of the Federal Financial Management Improvement Act (FFMIA), management is responsible for reporting on its implementation and maintenance of financial management systems that substantially comply with Federal financial management systems requirements, applicable Federal accounting standards, and the U.S. Government Standard General Ledger (SGL) at the transaction level. NASA's financial management systems are in substantial compliance with the requirements of FFMIA as of September 30, 2010.

As stated above, I am pleased that our one remaining FY 2009 prior year material weakness was resolved in FY 2010. In addition, NASA financial management systems are now in substantial compliance with FFMIA requirements. NASA will continue to work to ensure that its internal control program prevents new material weaknesses from developing.

Charles F. Bolden Jr.
Administrator

Photo, previous page: Space Exploration Vehicle Rovers A and B are shown docked with the Habitat Demonstration Unit during the Desert RATS 2010 operations at Black Point Lava Flow, Arizona. (Credit: NASA)

The Government Accountability Office (GAO) High-Risk List

NASA has been on the GAO High-Risk List in the area of Contract Management since 1990, when the first High-Risk List was published. In the most recent GAO update to the High-Risk List, issued in January 2009, GAO changed the title of this High-Risk item from Contract Management to Acquisition Management, acknowledging the broad scope of issues being addressed. As of January 2009, GAO noted that NASA has made a concerted effort to improve and has made important advances, but added that it will take several years for the Agency to fully implement its High-Risk initiatives.

The NASA initiatives are identified in a comprehensive Corrective Action Plan that meets Office of Management and Budget (OMB) requirements. Successful implementation of both the plan and revised policies should stem cost growth and schedule slippage. Additional information is available at *http://www.nasa.gov/news/budget/index.html*.

Credit: NASA

This fall, NASA's Ames Research Center hosted an event for all ages to celebrate the 2010 International Observe the Moon Night. During the event, participants were able to view the Moon through telescopes set up by members of local amateur astronomy societies.

Looking Forward

The NASA Authorization Act of 2010, signed by the President on October 11, 2010, ended months of effort, negotiation, and debate to decide the direction of NASA's future. NASA now has a clear direction and can begin making plans for moving the Agency forward. There are still many details that the appropriations process will provide, but the broad guidelines are now in place. NASA is currently creating the Agency's next Strategic Plan, due to be unveiled in February 2011, which will articulate NASA's new Strategic Goals and direction. As part of this effort, NASA is also working to improve the Agency's performance management framework and how NASA measures and reports on performance throughout the organization.

This is a wonderful time for NASA—a time of excellent opportunities to shape a promising future for the Nation's space program. At the same time, an incredible amount of work lies ahead. In the broadest sense, NASA's biggest adjustments will be how to pursue the migration to commercial access to low Earth orbit, and place the U.S. space program on a more sustainable trajectory.

The Agency is excited at the prospect of developing multiple sources of access to space and opening up an entirely new segment of the American economy. Even though there are still many details to be completed, about the nature of NASA oversight and input in the commercial partnerships to be formed, NASA remains committed to making measured progress and not rushing into anything that does not ensure safety while achieving the Agency's goals.

President Obama has laid out an ambitious plan for NASA that pioneers new frontiers of innovation and discovery. The plan invests more in NASA; extends the life of the International Space Station; launches a commercial space transportation industry; fosters the development of ground-breaking technologies; and helps create

Photo above: NASA Astronaut Leland Melvin high-fives fifth- through 12th-graders at the Minority Student Education Forum. The forum was part of NASA's "Summer of Innovation" initiative and the Federal "Education to Innovate" campaign to increase the number of future scientists, mathematicians, and engineers. Early in FY 2011, Administrator Bolden named Melvin the new director of NASA's Office of Education. (Credit: NASA/C. Huston

thousands of new jobs. As NASA evaluates how to build on the legacy of the Space Shuttle and Constellation programs, the Agency will be striving to ensure that its skilled workforce has many opportunities to contribute to these future objectives. The talented and dedicated workforce that has helped to achieve so much over more than five decades will be crucial to the future, as well.

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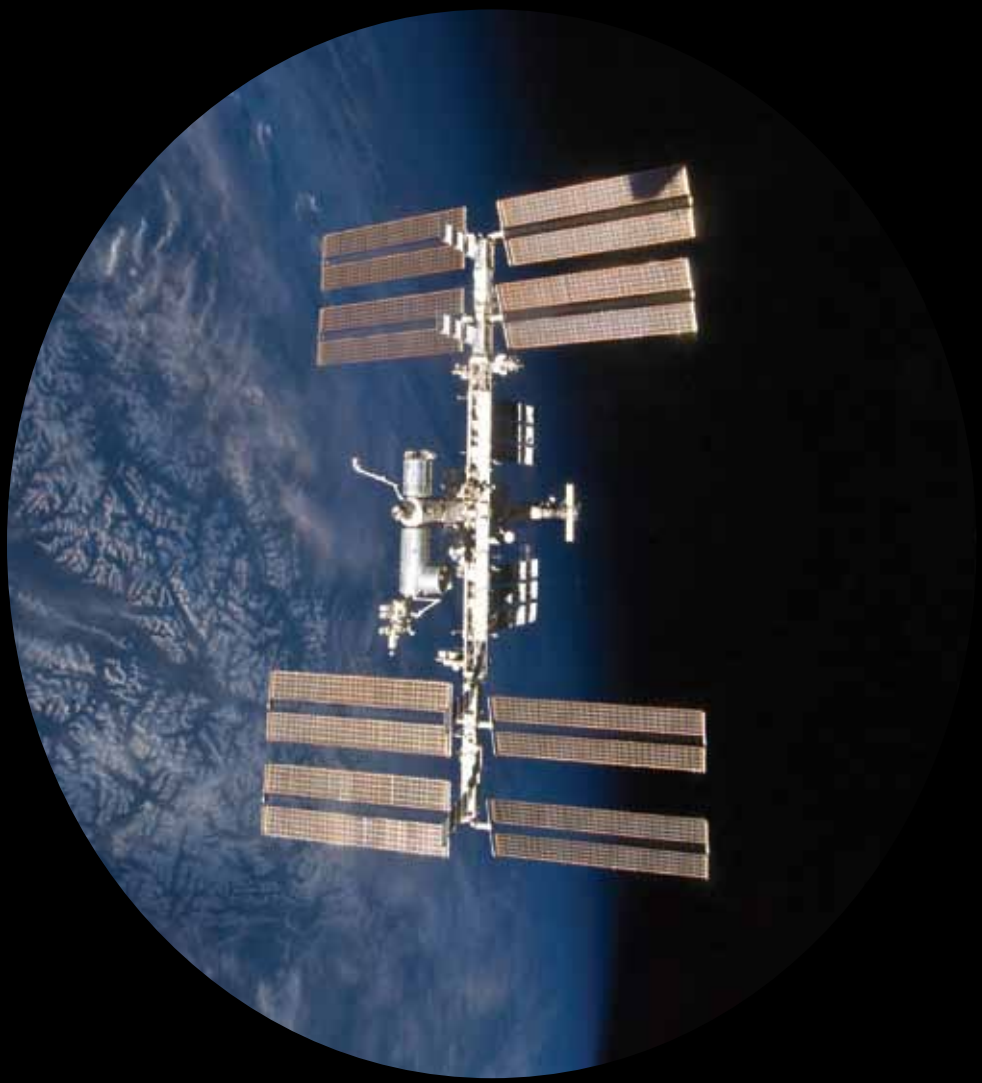
Photo back cover: Backdropped by Earth's horizon and the blackness of space, the International Space Station is featured in this image photographed by an STS-131 crewmember after Space Shuttle *Discovery* began to undock and separate from the Station. (Credit: NASA)



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